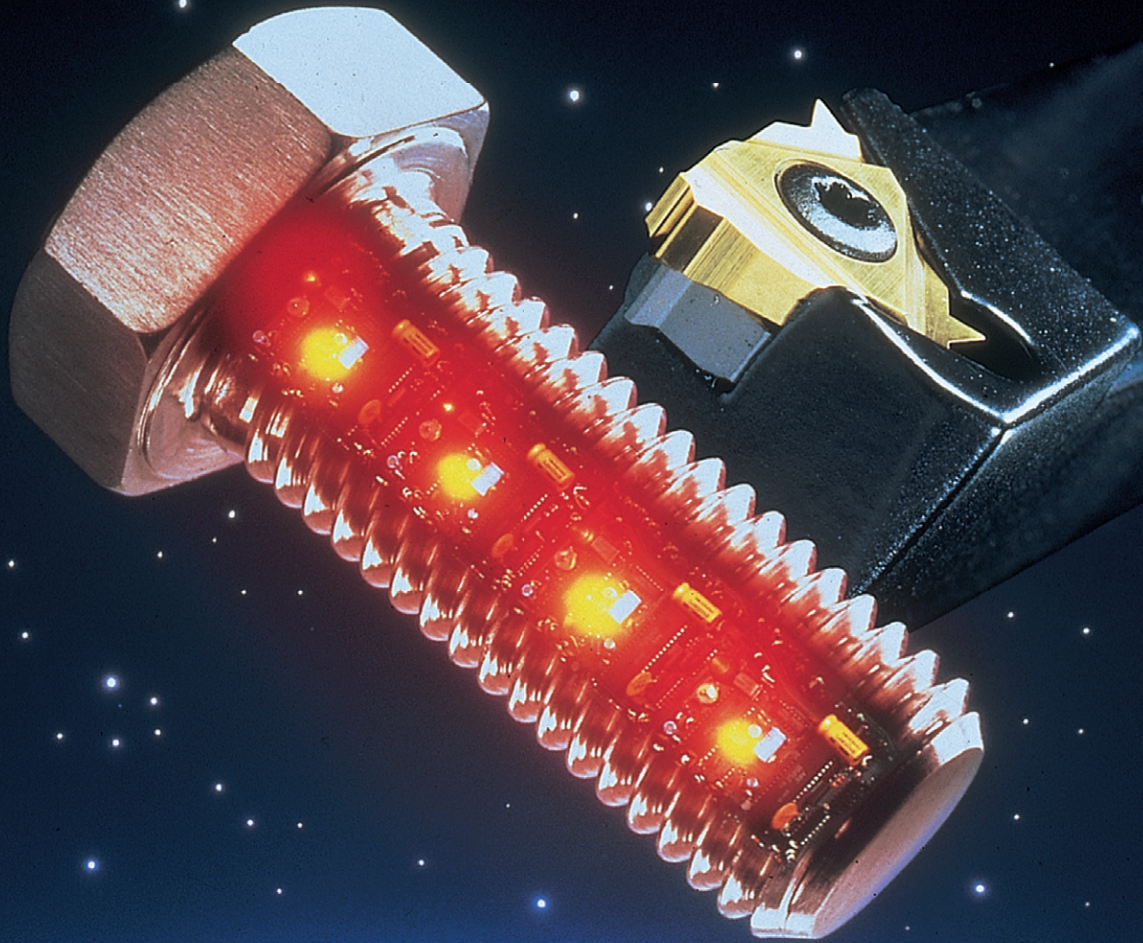




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TOOLS BV

specialist in machining tools

2023
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THREADING

THREADING

MILLING

THREAD MILLING

TURNING

DRILLING

GROOVING & PARTING

Combidex

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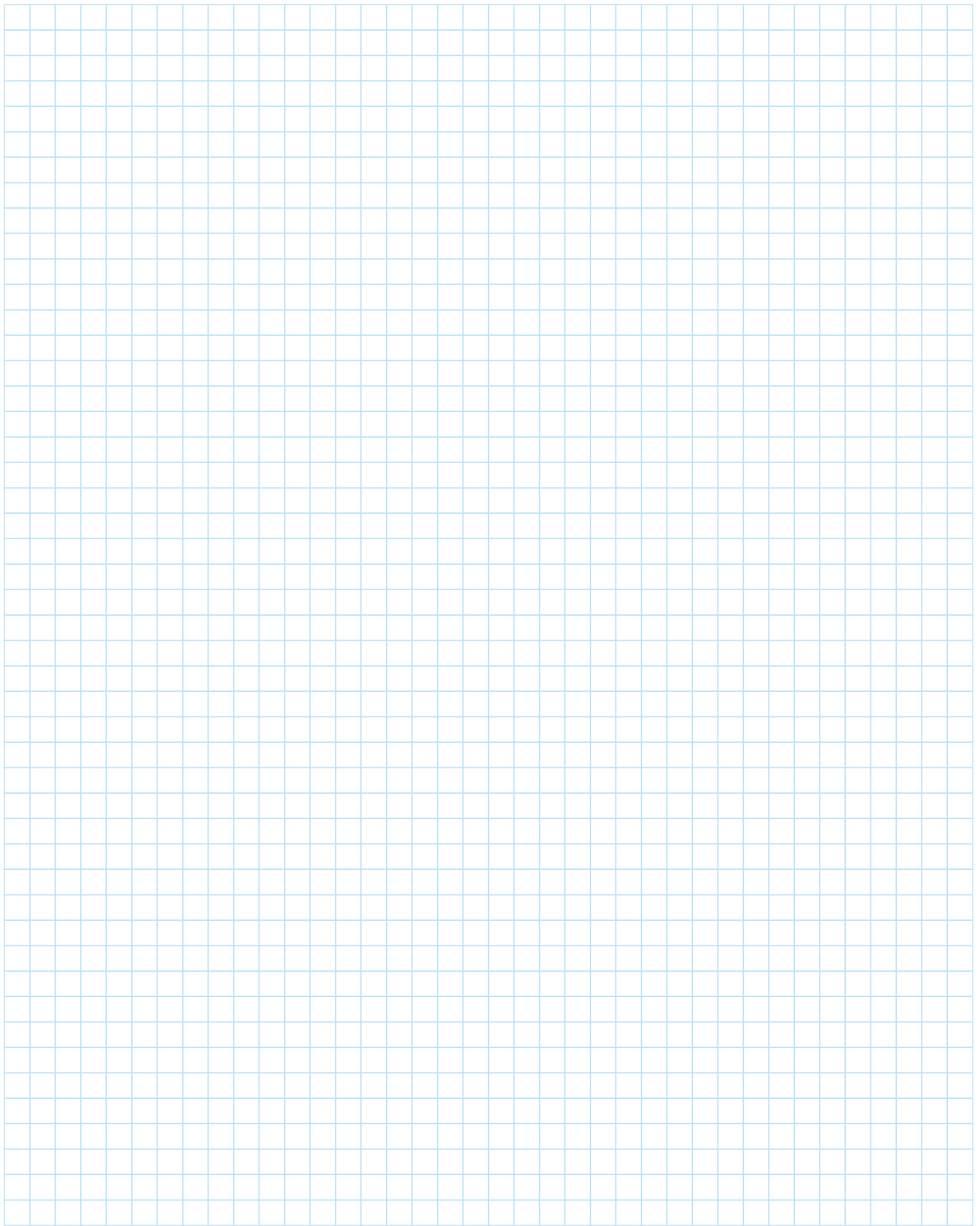
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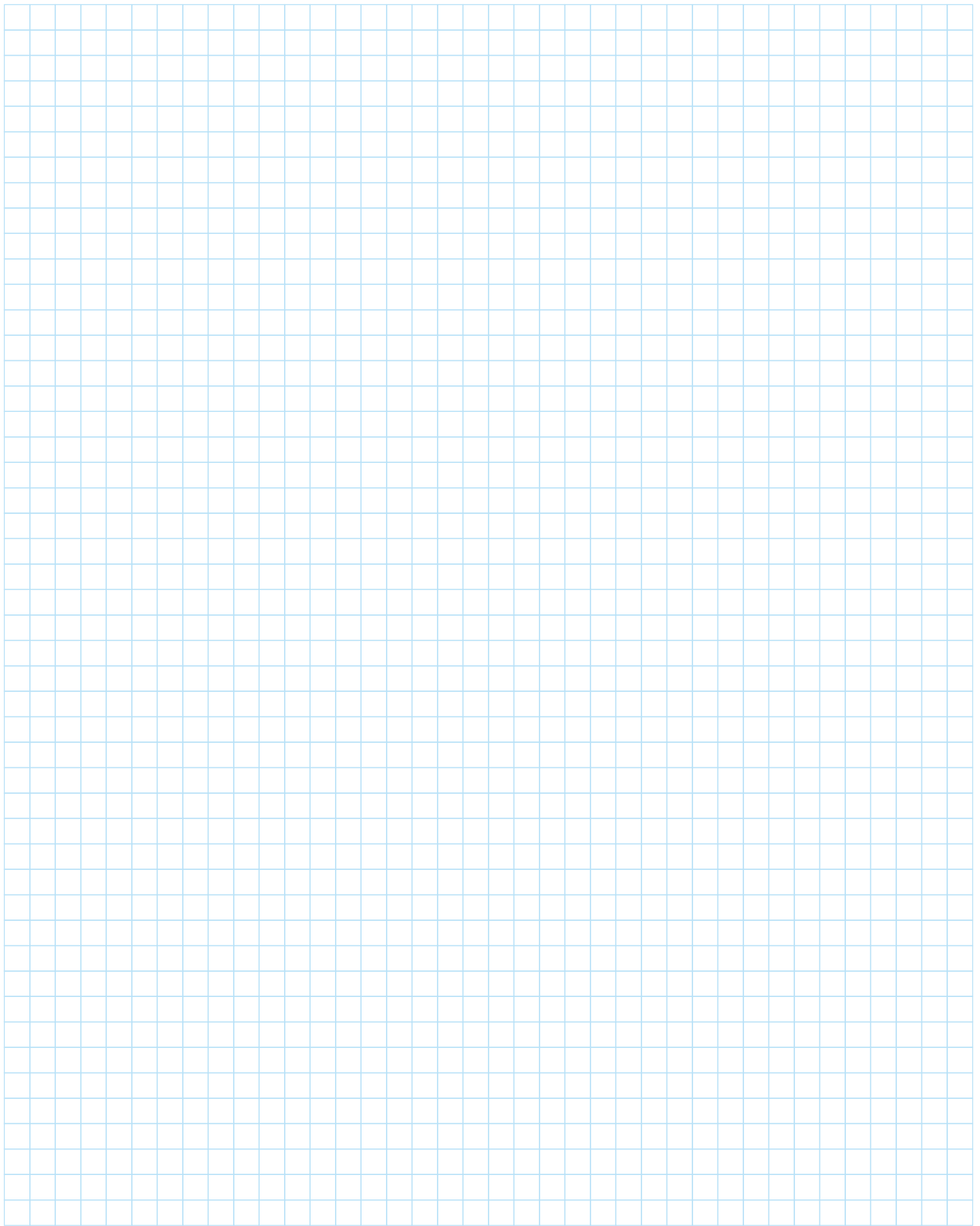
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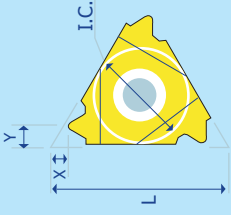




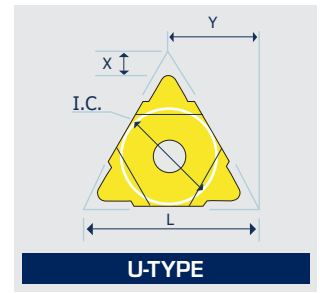
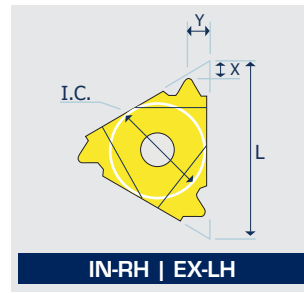
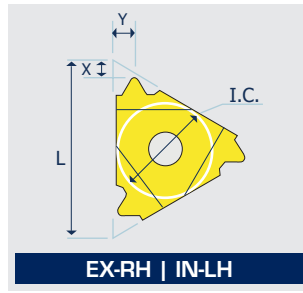
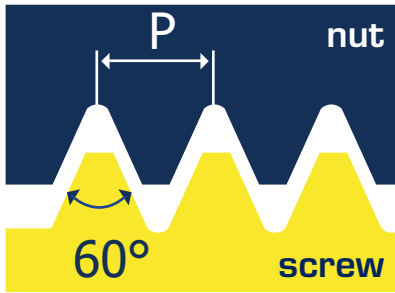
1.1 THREAD TURNING INSERTS



1.1.1 THREADING INSERTS | Ordering codes

16	↓	E	↓	R	↓	B	↓	12	↓	UN	↓	FXA					
		E External I Internal		R Right Hand L Left Hand		B = Chipbreaker		Pitch in mm: 0.25 - 12 Or TPI (threads per inch) 72-2		FULL PROFILES: ISO UN WHIT NPT NPTF NPS NPSM BSPT DIN 477 AGME ST.ACME TRAPEZ ROUND UNJ MJ PG AM. BUTT. SAGE H90 API API-ROUND EXTREME-LINI ABUT PAC VAM		PARTIAL PROFILES: A G AG N Q U		Multitooth style & nr. of teeth API size & taper		Carbide Grades K20 P30 PC30 FXA FXCL FXS	
		L I.C. 06 5/32" 08 3/16" 08U 3/16"U 11 1/4" 16 3/8" 16V 3/8" 22 1/2" 22U 1/2"U 22V 1/2" 27 5/8" 27U 5/8"U 27V 5/8" 33U 3/4"U															

1.1.2 PARTIAL PROFILES 60° | & Type B

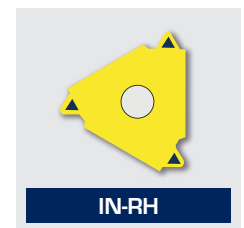


L	I.C. in	Pitch Range		EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
		mm	TPI	Right Hand	Left Hand	Right Hand	Left Hand		
6	5/32	0.5 - 1.25	48 - 20	ULTRA MINIATURE	→	*06 IR A60	*06 IL A60	0.6	0.6
8	3/16	0.5 - 1.5	48 - 16	MINIATURE	→	*08 IR A60	*08 IL A60	0.6	0.7
8U	3/16U	1.75 - 2.0	14 - 11	"U" MINIATURE	→	*08U IR/L U60		0.8	4.0
11	1/4	0.5 - 1.5	48 - 16	11 ER A 60	11 EL A60	11 IR A60	11 IL A60	0.8	0.9
16	3/8	0.5 - 1.5	48 - 16	16 ER A 60	16 EL A60	16 IR A60	16 IL A60	0.8	0.9
16	3/8	1.75 - 3.0	14 - 8	16 ER G 60	16 EL G60	16 IR G60	16 IL G60	1.2	1.7
16	3/8	0.5 - 3.0	48 - 8	16 ER AG 60	16 EL AG60	16 IR AG60	16 IL AG60	1.2	1.7
22	1/2	3.5 - 5.0	7 - 5	22 ER N 60	22 EL N60	22 IR N60	22 IL N60	1.7	2.5
22U	1/2U	5.5 - 8.0	4.5 - 3.25	22U E/I/R/L U60				0.6	11.0
27	5/8	5.5 - 6.0	4.5 - 4	27 ER Q60	27 EL Q60	27 IR Q60	27 IL Q60	2.1	3.1
27U	5/8U	6.5 - 9.0	4 - 2.75	27U E/I/R/L U60				1.0	13.7

* Only available in FXCL en FXA grades
Order example: 11 ER A60 FXA

Type B

Ground profile with sintered chip-breaker

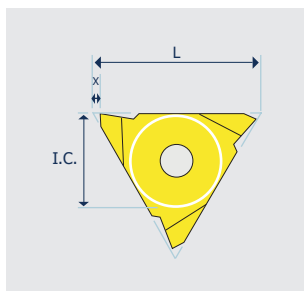
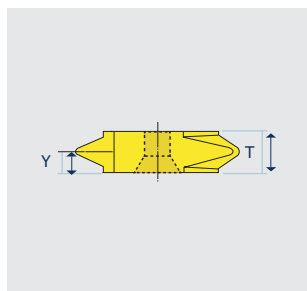


L	I.C. in	Pitch Range		EXTERNAL Ordering Code	INTERNAL Ordering Code	X	Y
		mm	TPI	Right Hand	Right Hand		
16	3/8	0.5 - 1.5	48 - 16	16 ER B A60	16 IR B A60	0.8	0.9
16	3/8	1.75 - 3.0	14 - 8	16 ER B G60	16 IR B G60	1.2	1.7
16	3/8	0.5 - 3.0	48 - 8	16 ER B AG60	16 IR B AG60	1.2	1.7

Order example: 16 ER B A60 FXA

For carbide grade and cutting speed see page 78 & 79

1.1.3 PARTIAL PROFILES 60° | Vertical

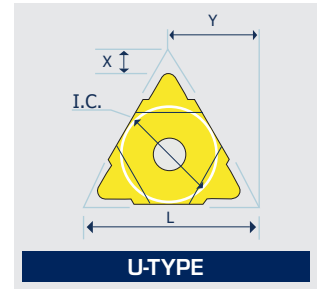
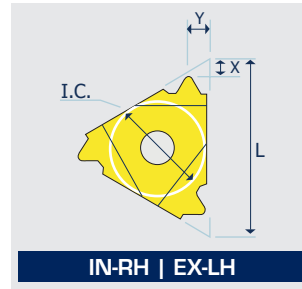
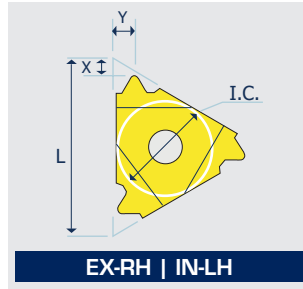
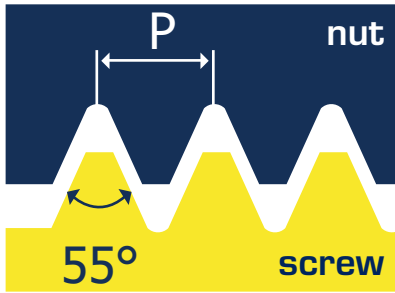


L	I.C. in	Pitch Range		EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y	T
		mm	TPI	Right Hand		Left Hand				
				Right Hand	Left Hand	Right Hand	Left Hand			
16	3/8	0.5 - 1.5	48 - 16	16V ER A60	16V EL A60			1.0	0.9	3.6
16	3/8	1.75 - 3.0	14 - 8	16V ER G60	16V EL G60			1.0	1.8	3.6
16	3/8	0.5 - 3.0	48 - 8	16V ER AG60	16V EL AG60			1.0	1.8	3.6
22	1/2	1.75 - 3.0	14 - 8	22V ER G60	22V EL G60			1.2	1.7	4.0
22	1/2	3.5 - 5.0	7 - 5	22V ER N60	22V EL N60			1.2	2.5	4.8
27	5/8	6.0 - 10.0	4 - 2.5	27V ER V60	27V EL V60	27V IR V60	27V IL V60	1.8	5.2	10.4

Order example: 16V ER A60 FXA

For carbide grade and cutting speed see page 78 & 79

1.1.4 PARTIAL PROFILES 55° | & Type B

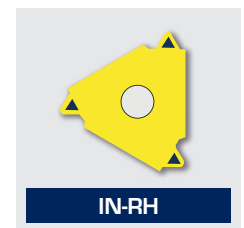


L	I.C. in	Pitch Range		EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
		mm	TPI	Right Hand	Left Hand	Right Hand	Left Hand		
6	5/32	0.5 - 1.25	48 - 20	ULTRA MINIATURE	→	*06 IR A55	*06 IL A55	0.5	0.6
8	3/16	0.5 - 1.5	48 - 16	MINIATURE	→	*08 IR A55	*08 IL A55	0.6	0.7
8U	3/16U	1.75 - 2.0	14 - 11	"U" MINIATURE	→	*08U IR/L U55		0.9	4.0
11	1/4	0.5 - 1.5	48 - 16	11 ER A55	11 EL A55	11 IR A55	11 IL A55	0.8	0.9
16	3/8	0.5 - 1.5	48 - 16	16 ER A55	16 EL A55	16 IR A55	16 IL A55	0.8	0.9
16	3/8	1.75 - 3.0	14 - 8	16 ER G55	16 EL G55	16 IR G55	16 IL G55	1.2	1.7
16	3/8	0.5 - 3.0	48 - 8	16 ER AG55	16 EL AG55	16 IR AG55	16 IL AG55	1.2	1.7
22	1/2	3.5 - 5.0	7 - 5	22 ER N55	22 EL N55	22 IR N55	22 IL N55	1.7	2.5
22U	1/2U	5.5 - 8.0	4.5 - 3.25	22U E/I/R/L U55				0.9	11.0
27	5/8	5.5 - 6.0	4.5 - 4	27 ER Q55	27 EL Q55	27 IR Q55	27 IL Q55	2.0	2.9
27U	5/8U	6.5 - 9.0	4 - 2.75	27U E/I/R/L U55				1.2	13.7

* Only available in FXCL en FXA grades
Order example: 11 ER A55 FXA

Type B

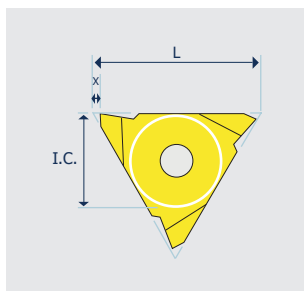
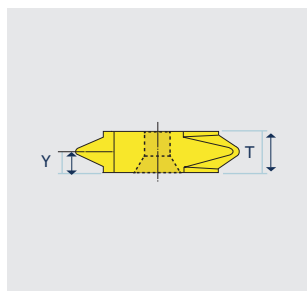
Ground profile with sintered chip-breaker



L	I.C. in	Pitch Range		EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
		mm	TPI	Right Hand		Right Hand			
16	3/8	1.75 - 3.0	14 - 8	16 ER B G55		16 IR B G55		1.2	1.7
16	3/8	0.5 - 3.0	48 - 8	16 ER B AG55		16 IR B AG55		1.2	1.7

Order example: 16 ER B G55 FXA
For carbide grade and cutting speed see page 78 & 79

1.1.5 PARTIAL PROFILES 55° | Vertical

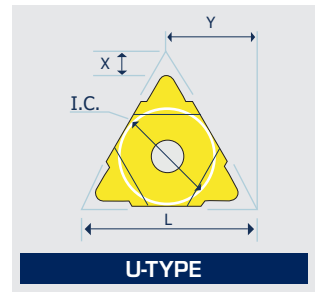
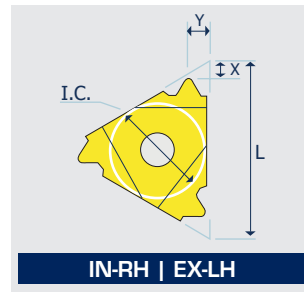
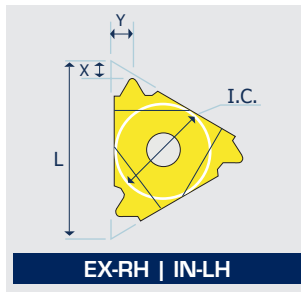
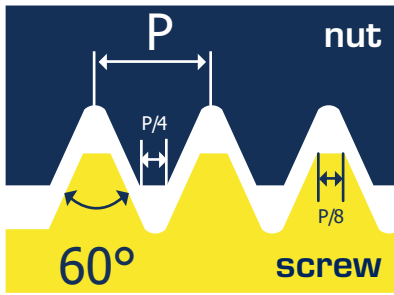


L	I.C. in	Pitch Range mm TPI		EXTERNAL		INTERNAL		X	Y	T
				Ordering Code		Ordering Code				
				Right Hand	Left Hand	Right Hand	Left Hand			
16	3/8	0.5 - 1.5	48 - 16	16V ER A55	16V EL A55			1.0	0.9	3.6
16	3/8	1.75 - 3.0	14 - 8	16V ER G55	16V EL G55			1.0	1.7	3.6
16	3/8	0.5 - 3.0	48 - 8	16V ER AG55	16V EL AG55			1.0	1.8	3.6
22	1/2	3.5 - 5.0	7 - 5	22V ER N55	22V EL N55			1.2	2.5	4.8
27	5/8	6.0 - 10.0	4 - 2.5	27V ER V55	27V EL V55	27V IR V55	27V IL V55	1.8	5.2	10.4

Order example: 16V EL A55 FXA

For carbide grade and cutting speed see page 78 & 79

1.1.6 ISO METRIC



Pitch mm	L	I.C. in	EXTERNAL				INTERNAL			
			Ordering Code		X	Y	Ordering Code		X	Y
			Right Hand	Left Hand			Right Hand	Left Hand		
0.25	6	5/32	ULTRA MINIATURE	→			*06 IR 0.25 ISO	*06 IL 0.25 ISO	0.7	0.3
0.5	6	5/32					*06 IR 0.5 ISO	*06 IL 0.5 ISO	0.9	0.5
0.75	6	5/32					*06 IR 0.75 ISO	*06 IL 0.75 ISO	0.8	0.5
1.0	6	5/32					*06 IR 1.0 ISO	*06 IL 1.0 ISO	0.7	0.6
1.25	6	5/32					*06 IR 1.25 ISO	*06 IL 1.25 ISO	0.6	0.6
0.25	8	3/16	MINIATURE	→			*08 IR 0.25 ISO	*08 IL 0.25 ISO	0.7	0.3
0.5	8	3/16					*08 IR 0.5 ISO	*08 IL 0.5 ISO	0.6	0.5
0.75	8	3/16					*08 IR 0.75 ISO	*08 IL 0.75 ISO	0.6	0.5
1.0	8	3/16					*08 IR 1.0 ISO	*08 IL 1.0 ISO	0.6	0.6
1.25	8	3/16					*08 IR 1.25 ISO	*08 IL 1.25 ISO	0.6	0.7
1.5	8	3/16					*08 IR 1.5 ISO	*08 IL 1.5 ISO	0.6	0.7
1.75	8	3/16	*08 IR 1.75 ISO	*08 IL 1.75 ISO	0.6	0.8				
2.0	8U	3/16U	"U" MINIATURE →				*08U IR/L 2.0 ISO		0.9	4.0
0.25	11	1/4	11 ER 0.25 ISO	11 EL 0.25 ISO	0.6	0.2				
0.3	11	1/4	11 ER 0.3 ISO	11 EL 0.3 ISO	0.8	0.3				
0.35	11	1/4	11 ER 0.35 ISO	11 EL 0.35 ISO	0.8	0.4	11 IR 0.35 ISO	11 IL 0.35 ISO	0.8	0.3
0.4	11	1/4	11 ER 0.4 ISO	11 EL 0.4 ISO	0.7	0.4	11 IR 0.4 ISO	11 IL 0.4 ISO	0.8	0.4
0.45	11	1/4	11 ER 0.45 ISO	11 EL 0.45 ISO	0.7	0.4	11 IR 0.45 ISO	11 IL 0.45 ISO	0.8	0.4
0.5	11	1/4	11 ER 0.5 ISO	11 EL 0.5 ISO	0.6	0.6	11 IR 0.5 ISO	11 IL 0.05 ISO	0.6	0.6
0.6	11	1/4	11 ER 0.6 ISO	11 EL 0.6 ISO	0.6	0.6	11 IR 0.6 ISO	11 IL 0.6 ISO	0.6	0.6
0.7	11	1/4	11 ER 0.7 ISO	11 EL 0.7 ISO	0.6	0.6	11 IR 0.7 ISO	11 IL 0.7 ISO	0.6	0.6
0.75	11	1/4	11 ER 0.75 ISO	11 EL 0.75 ISO	0.6	0.6	11 IR 0.75 ISO	11 IL 0.75 ISO	0.6	0.6
0.8	11	1/4	11 ER 0.8 ISO	11 EL 0.8 ISO	0.6	0.6	11 IR 0.8 ISO	11 IL 0.8 ISO	0.6	0.6
1.0	11	1/4	11 ER 1.0 ISO	11 EL 1.0 ISO	0.7	0.7	11 IR 1.0 ISO	11 IL 1.0 ISO	0.6	0.7
1.25	11	1/4	11 ER 1.25 ISO	11 EL 1.25 ISO	0.8	0.9	11 IR 1.25 ISO	11 IL 1.25 ISO	0.8	0.8
1.5	11	1/4	11 ER 1.5 ISO	11 EL 1.5 ISO	0.8	1.0	11 IR 1.5 ISO	11 IL 1.5 ISO	0.8	1.0
1.75	11	1/4	11 ER 1.75 ISO	11 EL 1.75 ISO	0.8	1.1	11 IR 1.75 ISO	11 IL 1.75 ISO	0.8	1.1
2.0	11	1/4	11 ER 2.0 ISO	11 EL 2.0 ISO	0.8	1.1	11 IR 2.0 ISO	11 IL 2.0 ISO	0.8	0.9
2.5	11	1/4					11 IR 2.5 ISO	11 IL 2.5 ISO	0.8	1.2
0.25	16	3/8	16 ER 0.25 ISO	16 EL 0.25 ISO	0.6	0.2				
0.3	16	3/8	16 ER 0.3 ISO	16 EL 0.3 ISO	0.8	0.3				
0.35	16	3/8	16 ER 0.35 ISO	16 EL 0.35 ISO	0.8	0.4	16 IR 0.35 ISO	16 IL 0.35 ISO	0.8	0.3
0.4	16	3/8	16 ER 0.4 ISO	16 EL 0.4 ISO	0.7	0.4	16 IR 0.4 ISO	16 IL 0.4 ISO	0.8	0.4
0.45	16	3/8	16 ER 0.45 ISO	16 EL 0.45 ISO	0.7	0.4	16 IR 0.45 ISO	16 IL 0.45 ISO	0.8	0.4
0.5	16	3/8	16 ER 0.5 ISO	16 EL 0.5 ISO	0.6	0.6	16 IR 0.5 ISO	16 IL 0.5 ISO	0.6	0.6
0.6	16	3/8	16 ER 0.6 ISO	16 EL 0.6 ISO	0.6	0.6	16 IR 0.6 ISO	16 IL 0.6 ISO	0.6	0.6
0.7	16	3/8	16 ER 0.7 ISO	16 EL 0.7 ISO	0.6	0.6	16 IR 0.7 ISO	16 IL 0.7 ISO	0.6	0.6
0.75	16	3/8	16 ER 0.75 ISO	16 EL 0.75 ISO	0.6	0.6	16 IR 0.75 ISO	16 IL 0.75 ISO	0.6	0.6
0.8	16	3/8	16 ER 0.8 ISO	16 EL 0.8 ISO	0.6	0.6	16 IR 0.8 ISO	16 IL 0.8 ISO	0.6	0.6
1.0	16	3/8	16 ER 1.0 ISO	16 EL 1.0 ISO	0.7	0.7	16 IR 1.0 ISO	16 IL 1.0 ISO	0.6	0.7
1.25	16	3/8	16 ER 1.25 ISO	16 EL 1.25 ISO	0.8	0.9	16 IR 1.25 ISO	16 IL 1.25 ISO	0.8	0.9
1.5	16	3/8	16 ER 1.5 ISO	16 EL 1.5 ISO	0.8	1.0	16 IR 1.5 ISO	16 IL 1.5 ISO	0.8	1.0
1.75	16	3/8	16 ER 1.75 ISO	16 EL 1.75 ISO	0.9	1.2	16 IR 1.75 ISO	16 IL 1.75 ISO	0.9	1.2

continue →

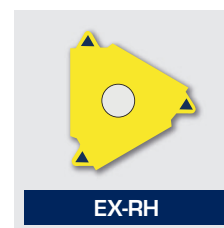
1.1.6 ISO METRIC | & Type B

Pitch mm	L	I.C. in	EXTERNAL				INTERNAL			
			Ordering Code		X	Y	Ordering Code		X	Y
			Right Hand	Left Hand			Right Hand	Left Hand		
2.0	16	3/8	16 ER 2.0 ISO	16 EL 2.0 ISO	1.0	1.3	16 IR 2.0 ISO	16 IL 2.0 ISO	1.0	1.3
2.5	16	3/8	16 ER 2.5 ISO	16 EL 2.5 ISO	1.1	1.5	16 IR 2.5 ISO	16 IL 2.5 ISO	1.1	1.5
3.0	16	3/8	16 ER 3.0 ISO	16 EL 3.0 ISO	1.2	1.6	16 IR 3.0 ISO	16 IL 3.0 ISO	1.1	1.5
3.5	16	3/8	16 ER 3.5 ISO	16 EL 3.5 ISO	1.2	1.7	16 IR 3.5 ISO	16 IL 3.5 ISO	1.2	1.7
3.5	22	1/2	22 ER 3.5 ISO	22 EL 3.5 ISO	1.6	2.3	22 IR 3.5 ISO	22 IL 3.5 ISO	1.6	2.3
4.0	22	1/2	22 ER 4.0 ISO	22 EL 4.0 ISO	1.6	2.3	22 IR 4.0 ISO	22 IL 4.0 ISO	1.6	2.3
4.5	22	1/2	22 ER 4.5 ISO	22 EL 4.5 ISO	1.7	2.4	22 IR 4.5 ISO	22 IL 4.5 ISO	1.6	2.4
5.0	22	1/2	22 ER 5.0 ISO	22 EL 5.0 ISO	1.7	2.5	22 IR 5.0 ISO	22 IL 5.0 ISO	1.6	2.3
5.5	22	1/2	22 ER 5.5 ISO	22 EL 5.5 ISO	1.7	2.6	22 IR 5.5 ISO	22 IL 5.5 ISO	1.6	2.3
6.0	22	1/2	**22 ER 6.0 ISO	**22 EL 6.0 ISO	1.9	2.7	22 IR 6.0 ISO	22 IL 6.0 ISO	1.6	2.4
5.5	22U	1/2U	22U ER/L 5.5 ISO		2.3	11.0	22U IR/L 5.5 ISO		2.4	11.0
6.0	22U	1/2U	22U ER/L 6.0 ISO		2.6	11.0	22U IR/L 6.0 ISO		2.1	11.0
5.5	27	5/8	27 ER 5.5 ISO	27 EL 5.5 ISO	1.9	2.7	27 IR 5.5 ISO	27 IL 5.5 ISO	1.6	2.3
6.0	27	5/8	27 ER 6.0 ISO	27 EL 6.0 ISO	2.0	2.9	27 IR 6.0 ISO	27 IL 6.0 ISO	1.8	2.5
8.0	27U	5/8U	27U ER/L 8.0 ISO		2.4	13.7	27U IR/L 8.0 ISO		2.4	13.7
12.0	33U	3/4U	33U ER/L 12.0 ISO		2.5	16.5	33U IR/L 12.0 ISO		3.5	16.9

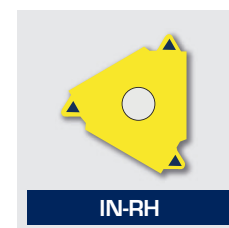
* Only available in FXCL en FXA grades

** A special holder is required

Order example: 22 ER 3.5 ISO FXA



EX-RH



IN-RH

Type B

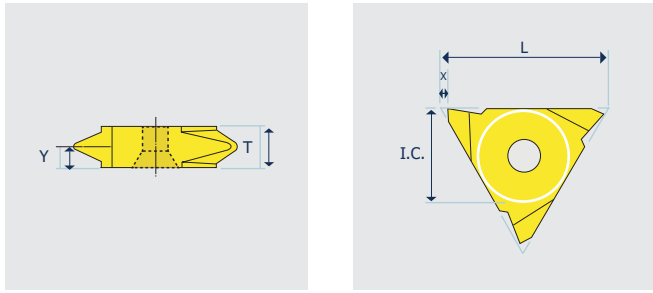
Ground profile with sintered chip-breaker

Pitch mm	L	I.C. in	EXTERNAL				INTERNAL			
			Ordering Code		X	Y	Ordering Code		X	Y
			Right Hand				Right Hand			
0.5	11	1/4					11 IR B 0.5 ISO		0.6	0.6
0.75	11	1/4					11 IR B 0.75 ISO		0.6	0.6
0.8	11	1/4					11 IR B 0.8 ISO		0.6	0.6
1.0	11	1/4					11 IR B 1.0 ISO		0.6	0.6
1.25	11	1/4					11 IR B 1.25 ISO		0.8	0.9
1.5	11	1/4					11 IR B 1.5 ISO		0.8	0.9
1.75	11	1/4					11 IR B 1.75 ISO		0.8	0.9
2.0	11	1/4					11 IR B 2.0 ISO		0.8	0.9
0.8	16	3/8	16 ER B 0.8 ISO		0.6	0.6				
1.0	16	3/8	16 ER B 1.0 ISO		0.7	0.7	16 IR B 1.0 ISO		0.6	0.7
1.25	16	3/8	16 ER B 1.25 ISO		0.8	0.9	16 IR B 1.25 ISO		0.8	0.9
1.5	16	3/8	16 ER B 1.5 ISO		0.8	1.0	16 IR B 1.5 ISO		0.8	1.0
1.75	16	3/8	16 ER B 1.75 ISO		0.9	1.2	16 IR B 1.75 ISO		0.9	1.2
2.0	16	3/8	16 ER B 2.0 ISO		1.0	1.3	16 IR B 2.0 ISO		1.0	1.3
2.5	16	3/8	16 ER B 2.5 ISO		1.1	1.5	16 IR B 2.5 ISO		1.1	1.5
3.0	16	3/8	16 ER B 3.0 ISO		1.2	1.6	16 IR B 3.0 ISO		1.1	1.5

Order example: 11 IR B 0.5 ISO FXA

For carbide grade and cutting speed see page 78 and 79

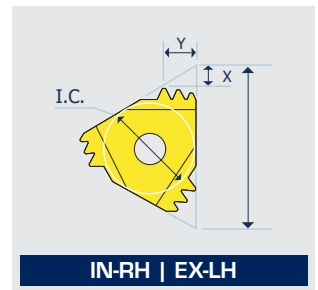
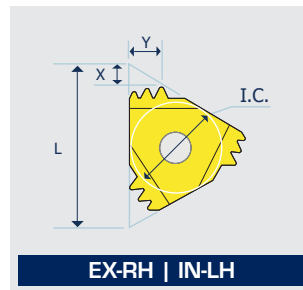
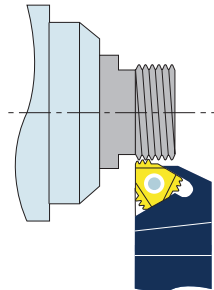
1.1.7 ISO METRIC | Vertical & multitooth



Pitch mm	L	I.C. in	EXTERNAL Ordering Code				INTERNAL Ordering Code				X	Y	T
			Right Hand		Left Hand		Right Hand		Left Hand				
			Ordering Code	ISO	Ordering Code	ISO	Ordering Code	ISO	Ordering Code	ISO			
0.5	16	3/8	16V ER 0.5	ISO	16V EL 0.5	ISO					1.0	0.6	3.6
0.75	16	3/8	16V ER 0.75	ISO	16V EL 0.75	ISO					1.0	0.6	3.6
0.8	16	3/8	16V ER 0.8	ISO	16V EL 0.8	ISO					1.0	0.6	3.6
1.0	16	3/8	16V ER 1.0	ISO	16V EL 1.0	ISO					1.0	0.7	3.6
1.25	16	3/8	16V ER 1.25	ISO	16V EL 1.25	ISO					1.0	0.9	3.6
1.5	16	3/8	16V ER 1.5	ISO	16V EL 1.5	ISO					1.0	0.9	3.6
1.75	16	3/8	16V ER 1.75	ISO	16V EL 1.75	ISO					1.0	1.2	3.6
2.0	16	3/8	16V ER 2.0	ISO	16V EL 2.0	ISO					1.0	1.3	3.6
2.5	16	3/8	16V ER 2.5	ISO	16V EL 2.5	ISO					1.0	1.5	3.6
3.0	16	3/8	16V ER 3.0	ISO	16V EL 3.0	ISO					1.0	1.7	3.6
* 8.0	27	5/8	27V ER 8.0	ISO	27V EL 8.0	ISO	27V IR 8.0	ISO	27V IL 8.0	ISO	1.8	5.2	10.4
** 10.0	27	5/8	27V ER 10.0	ISO	27V EL 10.0	ISO	27V IR 10.0	ISO	27V IL 10.0	ISO	1.8	5.2	10.4

Order example: 16V ER 0.5 ISO FXA

- * minimum bore: Ø 60 mm
- ** minimum bore: Ø 72 mm



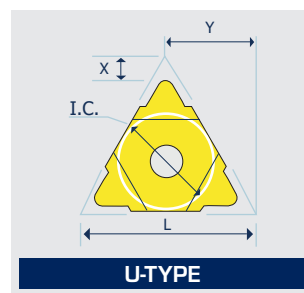
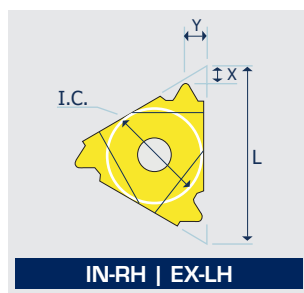
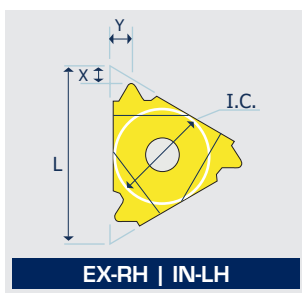
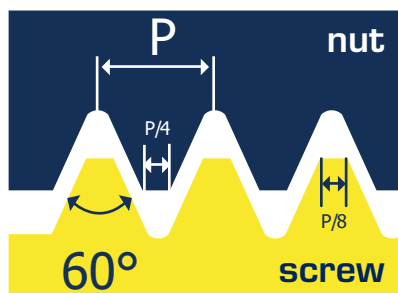
Multitooth

Pitch mm	L	I.C. in	Number of Teeth	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
				Anvil		Anvil			
				Ordering Code	ISO	Ordering Code	ISO		
1.0	16	3/8	3	16 ER 1.0 ISO 3M	YE16M	16 IR 1.0 ISO 3M	YI16M	1.7	2.5
1.5	16	3/8	2	16 ER 1.5 ISO 2M	YE16M	16 IR 1.5 ISO 2M	YI16M	1.5	2.3
2.0	16	3/8	2	16 ER 2.0 ISO 2M	YE16M	16 IR 2.0 ISO 2M	YI16M	2.0	3.0
1.5	22	1/2	3	22 ER 1.5 ISO 3M	YE22M	22 IR 1.5 ISO 3M	YI22M	2.3	3.7
2.0	22	1/2	2	22 ER 2.0 ISO 2M	YE22M	22 IR 2.0 ISO 2M	YI22M	2.0	3.0
2.0	22	1/2	3	22 ER 2.0 ISO 3M	YE22M	22 IR 2.0 ISO 3M	YI22M	3.1	5.0
2.0	22	1/2	2	22 ER 2.5 ISO 2M	YE22M	22 IR 2.5 ISO 2M	YI22M	2.4	3.7
2.5	22	1/2	3	22 ER 2.5 ISO 3M	YE22M	22 IR 2.5 ISO 3M	YI22M	3.8	6.2
3.0	27	5/8	2	27 ER 3.0 ISO 2M	YE27M	27 IR 3.0 ISO 2M	YI27M	2.9	4.6

Order example: 16 ER 1.0 ISO 3M FXA

For recommended number of passes see page 80
For carbide grade and cutting speed see page 78 & 79

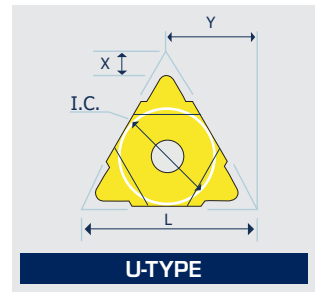
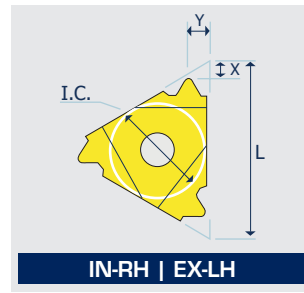
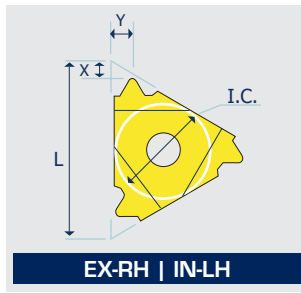
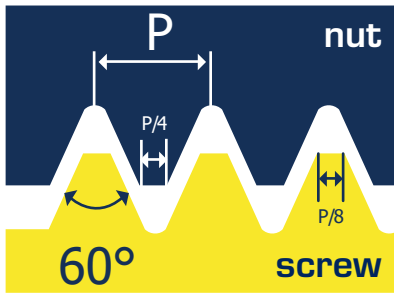
1.1.8 UN UNIFIED | UNC, UNF, UNEF, UNS



Pitch TPI	L	I.C. in	EXTERNAL				INTERNAL			
			Ordering Code		X	Y	Ordering Code		X	Y
			Right Hand	Left Hand			Right Hand	Left Hand		
32	6	5/32					*06 IR 32 UN	*06 IL 32 UN	0.8	0.5
28	6	5/32					*06 IR 28 UN	*06 IL 28 UN	0.8	0.6
24	6	5/32	ULTRA MINIATURE	→			*06 IR 24 UN	*06 IL 24 UN	0.7	0.6
20	6	5/32					*06 IR 20 UN	*06 IL 20 UN	0.6	0.6
18	6	5/32					*06 IR 18 UN	*06 IL 18 UN	0.6	0.7
32	8	3/16					*08 IR 32 UN	*08 IL 32 UN	0.6	0.5
28	8	3/16					*08 IR 28 UN	*08 IL 28 UN	0.6	0.6
24	8	3/16					*08 IR 24 UN	*08 IL 24 UN	0.6	0.6
20	8	3/16	MINIATURE	→			*08 IR 20 UN	*08 IL 20 UN	0.6	0.7
18	8	3/16					*08 IR 18 UN	*08 IL 18 UN	0.6	0.7
16	8	3/16					*08 IR 16 UN	*08 IL 16 UN	0.6	0.7
14	8	3/16					*08 IR 14 UN	*08 IL 14 UN	0.6	0.8
13	8	3/16					*08 IR 13 UN	*08 IL 13 UN	0.8	0.9
13	8U	3/16U	"U" MINIATURE	→			*08U IR/L 13 UN		1.0	4.0
12	8U	3/16U					*08U IR/L 12 UN		0.9	4.0
11	8U	3/16U					*08U IR/L 11 UN		0.9	4.0
80	11	1/4	11 ER 80 UN	11 EL 80 UN	0.8	0.4	11 IR 80 UN	11 IL 80 UN	0.8	0.4
72	11	1/4	11 ER 72 UN	11 EL 72 UN	0.8	0.4	11 IR 72 UN	11 IL 72 UN	0.8	0.3
64	11	1/4	11 ER 64 UN	11 EL 64 UN	0.8	0.4	11 IR 64 UN	11 IL 64 UN	0.8	0.4
56	11	1/4	11 ER 56 UN	11 EL 56 UN	0.7	0.4	11 IR 56 UN	11 IL 56 UN	0.7	0.4
48	11	1/4	11 ER 48 UN	11 EL 48 UN	0.6	0.6	11 IR 48 UN	11 IL 48 UN	0.6	0.6
44	11	1/4	11 ER 44 UN	11 EL 44 UN	0.6	0.6	11 IR 44 UN	11 IL 44 UN	0.6	0.6
40	11	1/4	11 ER 40 UN	11 EL 40 UN	0.6	0.6	11 IR 40 UN	11 IL 40 UN	0.6	0.6
36	11	1/4	11 ER 36 UN	11 EL 36 UN	0.6	0.6	11 IR 36 UN	11 IL 36 UN	0.6	0.6
32	11	1/4	11 ER 32 UN	11 EL 32 UN	0.6	0.6	11 IR 32 UN	11 IL 32 UN	0.6	0.6
28	11	1/4	11 ER 28 UN	11 EL 28 UN	0.6	0.7	11 IR 28 UN	11 IL 28 UN	0.6	0.7
27	11	1/4	11 ER 27 UN	11 EL 27 UN	0.7	0.8	11 IR 27 UN	11 IL 27 UN	0.7	0.8
24	11	1/4	11 ER 24 UN	11 EL 24 UN	0.7	0.8	11 IR 24 UN	11 IL 24 UN	0.7	0.8
20	11	1/4	11 ER 20 UN	11 EL 20 UN	0.8	0.9	11 IR 20 UN	11 IL 20 UN	0.8	0.9
18	11	1/4	11 ER 18 UN	11 EL 18 UN	0.8	1.0	11 IR 18 UN	11 IL 18 UN	0.8	1.0
16	11	1/4	11 ER 16 UN	11 EL 16 UN	0.9	1.1	11 IR 16 UN	11 IL 16 UN	0.9	1.1
14	11	1/4	11 ER 14 UN	11 EL 14 UN	0.9	1.1	11 IR 14 UN	11 IL 14 UN	0.9	1.1
13	11	1/4					11 IR 13 UN	11 IL 13 UN	0.8	1.0
12	11	1/4					11 IR 12 UN	11 IL 12 UN	0.9	1.1
11	11	1/4					11 IR 11 UN	11 IL 11 UN	0.8	1.1
80	16	3/8	16 ER 80 UN	16 EL 80 UN	0.8	0.4	16 IR 80 UN	16 IL 80 UN	0.8	0.4
72	16	3/8	16 ER 72 UN	16 EL 72 UN	0.8	0.4	16 IR 72 UN	16 IL 72 UN	0.8	0.3
64	16	3/8	16 ER 64 UN	16 EL 64 UN	0.8	0.4	16 IR 64 UN	16 IL 64 UN	0.8	0.4
56	16	3/8	16 ER 56 UN	16 EL 56 UN	0.7	0.4	16 IR 56 UN	16 IL 56 UN	0.7	0.4
48	16	3/8	16 ER 48 UN	16 EL 48 UN	0.6	0.6	16 IR 48 UN	16 IL 48 UN	0.6	0.6
44	16	3/8	16 ER 44 UN	16 EL 44 UN	0.6	0.6	16 IR 44 UN	16 IL 44 UN	0.6	0.6
40	16	3/8	16 ER 40 UN	16 EL 40 UN	0.6	0.6	16 IR 40 UN	16 IL 40 UN	0.6	0.6
36	16	3/8	16 ER 36 UN	16 EL 36 UN	0.6	0.6	16 IR 36 UN	16 IL 36 UN	0.6	0.6

continue →

1.1.8 UN UNIFIED | UNC, UNF, UNEF, UNS

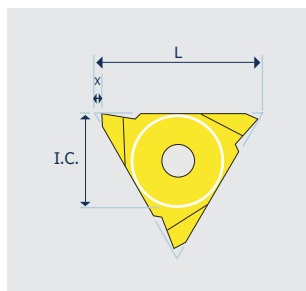
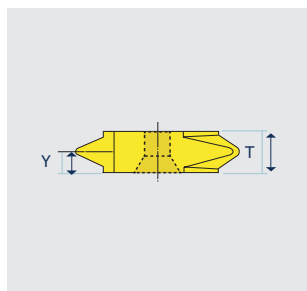


Pitch TPI	L	I.C. in	EXTERNAL				X	Y	INTERNAL			
			Ordering Code		X	Y			Ordering Code		X	Y
			Right Hand	Left Hand					Right Hand	Left Hand		
32	16	3/8	16 ER 32 UN	16 EL 32 UN	0.6	0.6	16 IR 32 UN	16 IL 32 UN	0.6	0.6		
28	16	3/8	16 ER 28 UN	16 EL 28 UN	0.6	0.7	16 IR 28 UN	16 IL 28 UN	0.6	0.7		
27	16	3/8	16 ER 27 UN	16 EL 27 UN	0.7	0.8	16 IR 27 UN	16 IL 27 UN	0.7	0.8		
24	16	3/8	16 ER 24 UN	16 EL 24 UN	0.7	0.8	16 IR 24 UN	16 IL 24 UN	0.7	0.8		
20	16	3/8	16 ER 20 UN	16 EL 20 UN	0.8	0.9	16 IR 20 UN	16 IL 20 UN	0.8	0.9		
18	16	3/8	16 ER 18 UN	16 EL 18 UN	0.8	1.0	16 IR 18 UN	16 IL 18 UN	0.8	1.0		
16	16	3/8	16 ER 16 UN	16 EL 16 UN	0.9	1.1	16 IR 16 UN	16 IL 16 UN	0.9	1.1		
14	16	3/8	16 ER 14 UN	16 EL 14 UN	1.0	1.2	16 IR 14 UN	16 IL 14 UN	0.9	1.2		
13	16	3/8	16 ER 13 UN	16 EL 13 UN	1.0	1.3	16 IR 13 UN	16 IL 13 UN	1.0	1.3		
12	16	3/8	16 ER 12 UN	16 EL 12 UN	1.1	1.4	16 IR 12 UN	16 IL 12 UN	1.1	1.4		
11.5	16	3/8	16 ER 11.5 UN	16 EL 11.5 UN	1.1	1.5	16 IR 11.5 UN	16 IL 11.5 UN	1.1	1.5		
11	16	3/8	16 ER 11 UN	16 EL 11 UN	1.1	1.5	16 IR 11 UN	16 IL 11 UN	1.1	1.5		
10	16	3/8	16 ER 10 UN	16 EL 10 UN	1.1	1.5	16 IR 10 UN	16 IL 10 UN	1.1	1.5		
9	16	3/8	16 ER 9 UN	16 EL 9 UN	1.2	1.7	16 IR 9 UN	16 IL 9 UN	1.2	1.7		
8	16	3/8	16 ER 8 UN	16 EL 8 UN	1.2	1.6	16 IR 8 UN	16 IL 8 UN	1.1	1.5		
7	22	1/2	22 ER 7 UN	22 EL 7 UN	1.6	2.3	22 IR 7 UN	22 IL 7 UN	1.6	2.3		
6	22	1/2	22 ER 6 UN	22 EL 6 UN	1.6	2.3	22 IR 6 UN	22 IL 6 UN	1.6	2.3		
5	22	1/2	22 ER 5 UN	22 EL 5 UN	1.7	2.5	22 IR 5 UN	22 IL 5 UN	1.6	2.3		
4.5	22U	1/2U	22U ER/L 4.5 UN		2.0	11.0	22U IR/L 4.5 UN		2.4	11.0		
4	22U	1/2U	22U ER/L 4 UN		2.0	11.0	22U IR/L 4 UN		2.4	11.0		
4.5	27	5/8	27 ER 4.5 UN	27 EL 4.5 UN	1.9	2.7	27 IR 4.5 UN	27 IL 4.5 UN	1.7	2.4		
4	27	5/8	27 ER 4 UN	27 EL 4 UN	2.1	3.0	27 IR 4 UN	27 IL 4 UN	1.8	2.7		
3	27U	5/8U	27U ER/L 3 UN		2.5	13.7	27U IR/L 3 UN		2.7	13.7		
2	33U	3/4U	33U ER/L 2 UN		2.8	16.5	33U IR/L 2 UN		3.6	16.9		

* Only available in FXCL and FXA grades
 ** To be used with holder SIR 0009 K08 on page 71

Order example: 16ER 32 UN FXA
 For carbide grade and cutting speed see page 78 & 79

1.1.9 UN UNIFIED | Vertical & Type B



Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y	T
			Right Hand	Left Hand	Right Hand	Left Hand			
			32	16	3/8	16V ER 32 UN			
28	16	3/8	16V ER 28 UN	16V EL 28 UN			1.0	0.7	3.6
24	16	3/8	16V ER 24 UN	16V EL 24 UN			1.0	0.8	3.6
20	16	3/8	16V ER 20 UN	16V EL 20 UN			1.0	0.9	3.6
18	16	3/8	16V ER 18 UN	16V EL 18 UN			1.0	1.0	3.6
16	16	3/8	16V ER 16 UN	16V EL 16 UN			1.0	1.1	3.6
14	16	3/8	16V ER 14 UN	16V EL 14 UN			1.0	1.2	3.6
12	16	3/8	16V ER 12 UN	16V EL 12 UN			1.0	1.4	3.6
10	16	3/8	16V ER 10 UN	16V EL 10 UN			1.0	1.5	3.6
8	16	3/8	16V ER 8 UN	16V EL 8 UN			1.0	1.6	3.6
7	22	1/2	22V ER 7 UN	22V EL 7 UN			1.2	2.3	4.8
* 3	27	5/8	27V ER 3 UN	27V EL 3 UN	27V IR 3 UN	27V IL 3 UN	1.8	5.2	10.4

UN - Unified UNC, UNF, UNED, UNS

Order example: 16V ER 32 UN FXA

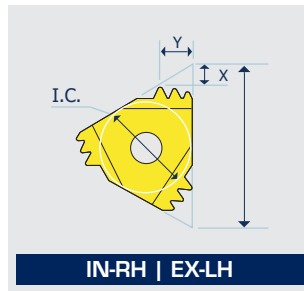
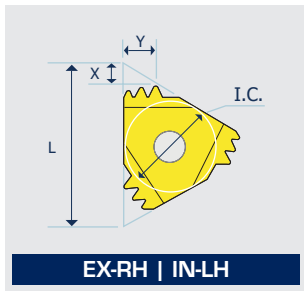
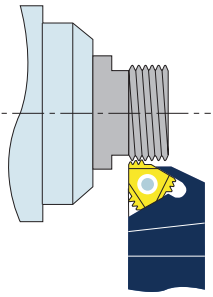
* minimum bore: Ø 65 mm

Type **B** Ground profile with sintered chip-breaker

Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		X	Y	INTERNAL Ordering Code		X	Y
			Right Hand				Right Hand			
			32	11			1/4			
28	11	1/4					11 IR B 28 UN	0.6	0.6	
24	11	1/4					11 IR B 24 UN	0.6	0.6	
20	11	1/4					11 IR B 20 UN	0.8	0.9	
18	11	1/4					11 IR B 18 UN	0.8	0.9	
16	11	1/4					11 IR B 16 UN	0.8	0.9	
14	11	1/4					11 IR B 14 UN	0.8	0.9	
12	11	1/4					11 IR B 12 UN	0.8	0.9	
24	16	3/8	16 ER B 24 UN		0.7	0.8	16 IR B 24 UN	0.7	0.8	
20	16	3/8	16 ER B 20 UN		0.8	0.9	16 IR B 20 UN	0.8	0.9	
18	16	3/8	16 ER B 18 UN		0.8	1.0	16 IR B 18 UN	0.8	1.0	
16	16	3/8	16 ER B 16 UN		0.9	1.1	16 IR B 16 UN	0.9	1.1	
14	16	3/8	16 ER B 14 UN		1.0	1.2	16 IR B 14 UN	0.9	1.2	
13	16	3/8	16 ER B 13 UN		1.0	1.3				
12	16	3/8	16 ER B 12 UN		1.1	1.4	16 IR B 12 UN	1.1	1.4	
11	16	3/8	16 ER B 11 UN		1.1	1.5				
10	16	3/8	16 ER B 10 UN		1.1	1.5	16 IR B 10 UN	1.1	1.5	
9	16	3/8	16 ER B 9 UN		1.2	1.7				
8	16	3/8	16 ER B 8 UN		1.2	1.6	16 IR B 8 UN	1.1	1.1	

Order example: 16 ER B 24 UN FXA

1.1.10 UN MULTITOOTH

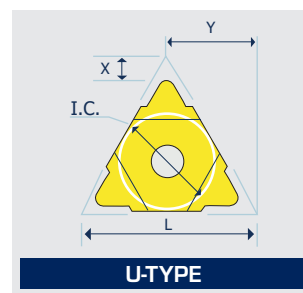
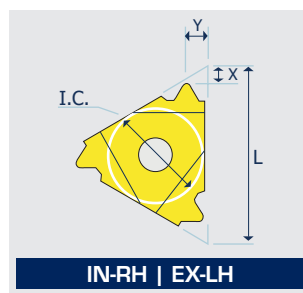
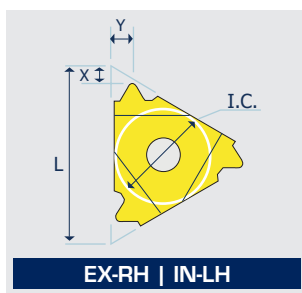
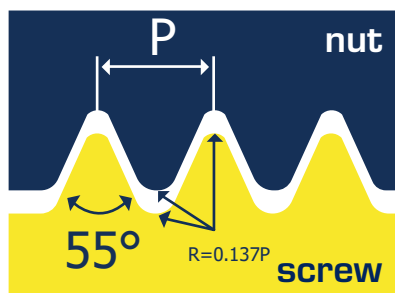


Pitch TPI	L	I.C. in	Number of Teeth	EXTERNAL		INTERNAL		X	Y
				Ordering Code	Anvil	Ordering Code	Anvil		
24	16	3/8	2	16 ER 24 UN 2M	YE16M	16 IR 24 UN 2M	YI16M	1.1	1.7
20	16	3/8	2	16 ER 20 UN 2M	YE16M	16 IR 20 UN 2M	YI16M	1.4	2.0
18	16	3/8	2	16 ER 18 UN 2M	YE16M	16 IR 18 UN 2M	YI16M	1.5	2.2
16	16	3/8	2	16 ER 16 UN 2M	YE16M	16 IR 16 UN 2M	YI16M	1.5	2.3
14	16	3/8	2	16 ER 14 UN 2M	YE16M	16 IR 14 UN 2M	YI16M	1.7	2.7
12	16	3/8	2	16 ER 12 UN 2M	YE16M	16 IR 12 UN 2M	YI16M	2.0	3.1
16	22	1/2	3	22 ER 16 UN 3M	YE22M	22 IR 16 UN 3M	YI22M	2.5	4.0
13	22	1/2	3	22 ER 13 UN 3M	YE22M		YI22M	3.0	4.9
12	22	1/2	2	22 ER 12 UN 2M	YE22M	22 IR 12 UN 2M	YI22M	2.2	3.4
12	22	1/2	3	22 ER 12 UN 3M	YE22M	22 IR 12 UN 3M	YI22M	3.3	5.3
8	27	5/8	2	27 ER 8 UN 2M	YE27M	27IR 8 UN 2M	YI27M	3.1	4.9

Order example: 16 ER 24 UN 2M FXA

For recommended number of passes see page 80

1.1.11 WHITWORTH - 55° | BSW, BSF, BSP, BSB



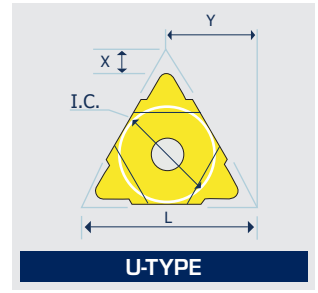
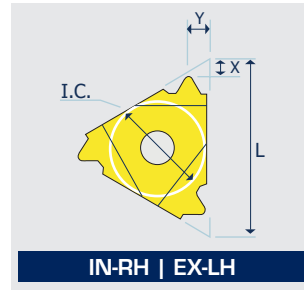
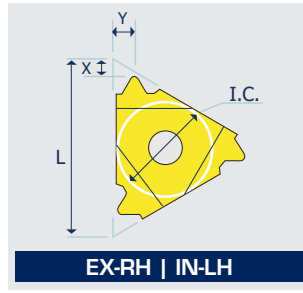
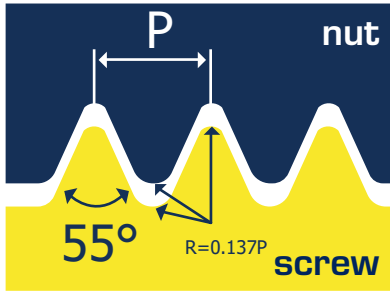
Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
			Right Hand	Left Hand	Right Hand	Left Hand		
26	6	5/32			*06 IR 26 W	*06 IL 26 W	0.7	0.6
22	6	5/32	ULTRA MINIATURE →		*06 IR 22 W	*06 IL 22 W	0.6	0.6
20	6	5/32			*06 IR 20 W	*06 IL 20 W	0.6	0.7
18	6	5/32			*06 IR 18 W	*06 IL 18 W	0.6	0.7
28	8	3/16	MINIATURE →		*08 IR 28 W	*08 IL 28 W	0.6	0.6
24	8	3/16			*08 IR 24 W	*08 IL 24 W	0.6	0.6
20	8	3/16			*08 IR 20 W	*08 IL 20 W	0.6	0.7
19	8	3/16			*08 IR 19 W	*08 IL 19 W	0.6	0.7
18	8	3/16			*08 IR 18 W	*08 IL 18 W	0.6	0.7
16	8	3/16			*08 IR 16 W	*08 IL 16 W	0.6	0.7
14	8U	3/16U	"U" MINIATURE →		*08U IR/L 14 W		1.0	4.0
12	8U	3/16U			*08U IR/L 12 W		0.9	4.0
11	8U	3/16U			*08U IR/L 11 W		0.9	4.0
72	11	1/4	11 ER 72 W	11 EL 72 W	11 IR 72 W	11 IL 72 W	0.7	0.4
60	11	1/4	11 ER 60 W	11 EL 60 W	11 IR 60 W	11 IL 60 W	0.7	0.4
56	11	1/4	11 ER 56 W	11 EL 56 W	11 IR 56 W	11 IL 56 W	0.7	0.4
48	11	1/4	11 ER 48 W	11 EL 48 W	11 IR 48 W	11 IL 48 W	0.6	0.6
40	11	1/4	11 ER 40 W	11 EL 40 W	11 IR 40 W	11 IL 40 W	0.6	0.6
36	11	1/4	11 ER 36 W	11 EL 36 W	11 IR 36 W	11 IL 36 W	0.6	0.6
32	11	1/4	11 ER 32 W	11 EL 32 W	11 IR 32 W	11 IL 32 W	0.6	0.6
28	11	1/4	11 ER 28 W	11 EL 28 W	11 IR 28 W	11 IL 28 W	0.6	0.7
26	11	1/4	11 ER 26 W	11 EL 26 W	11 IR 26 W	11 IL 26 W	0.7	0.7
24	11	1/4	11 ER 24 W	11 EL 24 W	11 IR 24 W	11 IL 24 W	0.7	0.8
22	11	1/4	11 ER 22 W	11 EL 22 W	11 IR 22 W	11 IL 22 W	0.8	0.9
20	11	1/4	11 ER 20 W	11 EL 20 W	11 IR 20 W	11 IL 20 W	0.8	0.9
19	11	1/4	11 ER 19 W	11 EL 19 W	11 IR 19 W	11 IL 19 W	0.8	1.0
18	11	1/4	11 ER 18 W	11 EL 18 W	11 IR 18 W	11 IL 18 W	0.8	1.0
16	11	1/4	11 ER 16 W	11 EL 16 W	11 IR 16 W	11 IL 16 W	0.9	1.1
14	11	1/4	11 ER 14 W	11 EL 14 W	11 IR 14 W	11 IL 14 W	0.9	1.1
12	11	1/4			11 IR 12 W	11 IL 12 W	0.1	1.1
11	11	1/4			(1) 11 IR 11 W	(1) 11 IL 11 W	0.9	1.2
72	16	3/8	16 ER 72 W	16 EL 72 W	16 IR 72 W	16 IL 72 W	0.7	0.4
60	16	3/8	16 ER 60 W	16 EL 60 W	16 IR 60 W	16 IL 60 W	0.7	0.4
56	16	3/8	16 ER 56 W	16 EL 56 W	16 IR 56 W	16 IL 56 W	0.7	0.4
48	16	3/8	16 ER 48 W	16 EL 48 W	16 IR 48 W	16 IL 48 W	0.6	0.6
40	16	3/8	16 ER 40 W	16 EL 40 W	16 IR 40 W	16 IL 40 W	0.6	0.6
36	16	3/8	16 ER 36 W	16 EL 36 W	16 IR 36 W	16 IL 36 W	0.6	0.6
32	16	3/8	16 ER 32 W	16 EL 32 W	16 IR 32 W	16 IL 32 W	0.6	0.6
28	16	3/8	16 ER 28 W	16 EL 28 W	16 IR 28 W	16 IL 28 W	0.6	0.7
26	16	3/8	16 ER 26 W	16 EL 26 W	16 IR 26 W	16 IL 26 W	0.7	0.7
24	16	3/8	16 ER 24 W	16 EL 24 W	16 IR 24 W	16 IL 24 W	0.7	0.8

* Only available in FXCL en FXA grades

(1) A special holder is required or standard holder can be amended by customer

continue →

1.1.11 WHITWORTH - 55° | BSW, BSF, BSP, BSB



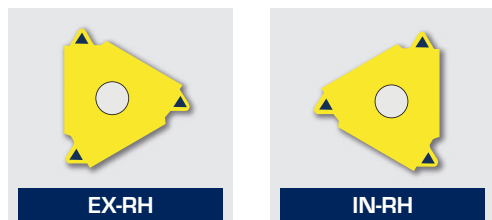
Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
			Right Hand	Left Hand	Right Hand	Left Hand		
			22	16	3/8	16 ER 22 W		
20	16	3/8	16 ER 20 W	16 EL 20 W	16 IR 20 W	16 IL 20 W	0.8	0.9
19	16	3/8	16 ER 19 W	16 EL 19 W	16 IR 19 W	16 IL 19 W	0.8	1.0
18	16	3/8	16 ER 18 W	16 EL 18 W	16 IR 18 W	16 IL 18 W	0.8	1.0
16	16	3/8	16 ER 16 W	16 EL 16 W	16 IR 16 W	16 IL 16 W	0.9	1.1
14	16	3/8	16 ER 14 W	16 EL 14 W	16 IR 14 W	16 IL 14 W	1.0	1.2
12	16	3/8	16 ER 12 W	16 EL 12 W	16 IR 12 W	16 IL 12 W	1.1	1.4
11	16	3/8	16 ER 11 W	16 EL 11 W	16 IR 11 W	16 IL 11 W	1.1	1.5
10	16	3/8	16 ER 10 W	16 EL 10 W	16 IR 10 W	16 IL 10 W	1.1	1.5
9	16	3/8	16 ER 9 W	16 EL 9 W	16 IR 9 W	16 IL 9 W	1.2	1.7
8	16	3/8	16 ER 8 W	16 EL 8 W	16 IR 8 W	16 IL 8 W	1.2	1.5
7	22	1/2	22 ER 7 W	22 EL 7 W	22 IR 7 W	22 IL 7 W	1.6	2.3
6	22	1/2	22 ER 6 W	22 EL 6 W	22 IR 6 W	22 IL 6 W	1.6	2.3
5	22	1/2	22 ER 5 W	22 EL 5 W	22 IR 5 W	22 IL 5 W	1.7	2.4
4.5	22U	1/2U	22U E/I/R/L 4.5 W				2.3	11.0
4	22U	1/2U	22U E/I/R/L 4 W				2.8	11.0
4.5	27	5/8	27 ER 4.5 W	27 EL 4.5 W	27 IR 4.5 W	27 IL 4.5 W	1.8	2.6
4	27	5/8	27 ER 4 W	27 EL 4 W	27 IR 4 W	27 IL 4 W	2.0	2.9
3.5	27U	5/8U	27U E/I/R/L 3.5 W				2.1	13.7
3.25	27U	5/8U	27U E/I/R/L 3.25 W				2.0	13.7
3	27U	5/8U	27U E/I/R/L 3 W				2.3	13.7
2.75	27U	5/8U	27U E/I/R/L 2.75 W				2.4	13.7
*2.625	27U	5/8U	27U E/I/R/L 2.625 W				2.5	13.7
*2.5	27U	5/8U	27U E/I/R/L 2.5 W				2.8	13.7

* One cutting edge
 Order example: 16 ER 22 W FXA
 For carbide grade and cutting speeds see page 78 & 79

1.1.12 WHITWORTH - 55° | BSW, BSF, BSP, BSB, Vertical & Type B

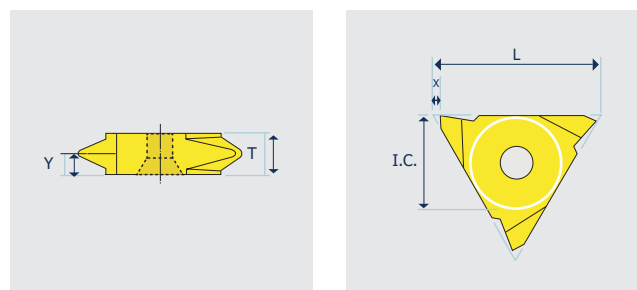
Type B

Ground profile with sintered chip-breaker



Pitch TPI	L	I.C. in	EXTERNAL	INTERNAL	X	Y
			Ordering Code Right Hand	Ordering Code Right Hand		
28	11	1/4		11 IR B 28 W	0.6	0.6
24	11	1/4		11 IR B 24 W	0.6	0.6
20	11	1/4		11 IR B 20 W	0.8	0.9
19	11	1/4		11 IR B 19 W	0.8	0.9
18	11	1/4		11 IR B 18 W	0.8	0.9
16	11	1/4		11 IR B 16 W	0.8	0.9
14	11	1/4		11 IR B 14 W	0.8	0.9
19	16	3/8	16 ER B 19 W	16 IR B 19 W	0.8	1.0
16	16	3/8	16 ER B 16 W	16 IR B 16 W	0.9	1.1
14	16	3/8	16 ER B 14 W	16 IR B 14 W	1.0	1.2
11	16	3/8	16 ER B 11 W	16 IR B 11 W	1.1	1.5
10	16	3/8	16 ER B 10 W	16 IR B 10 W	1.1	1.5

Order example: 11 IR B 28 W FXA

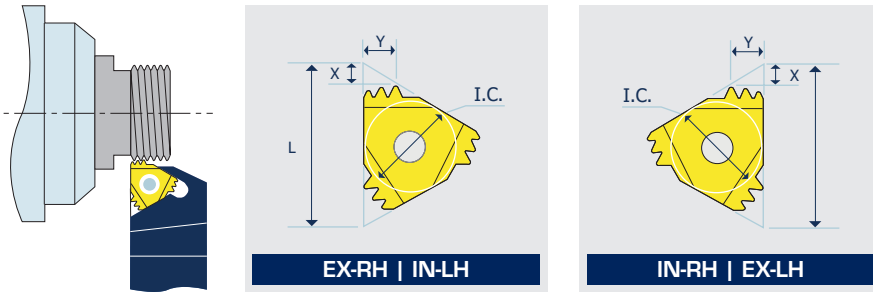


VERTICAL

Pitch TPI	L	I.C. in	EXTERNAL	INTERNAL	X	Y	T
			Ordering Code Right Hand	Ordering Code Left Hand			
20	16	3/8	16V ER 20 W	16V EL 20 W	1.0	0.9	3.6
19	16	3/8	16V ER 19 W	16V EL 19 W	1.0	0.9	3.6
18	16	3/8	16V ER 18 W	16V EL 18 W	1.0	1.0	3.6
16	16	3/8	16V ER 16 W	16V EL 16 W	1.0	1.0	3.6
14	16	3/8	16V ER 14 W	16V EL 14 W	1.0	1.2	3.6
12	16	3/8	16V ER 12 W	16V EL 12 W	1.0	1.4	3.6
11	16	3/8	16V ER 11 W	16V EL 11 W	1.0	1.5	3.6

Order example: 16V ER 20 W FXA

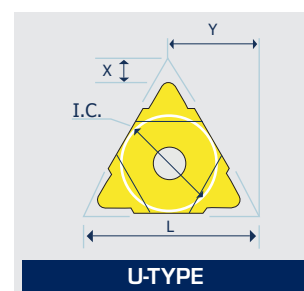
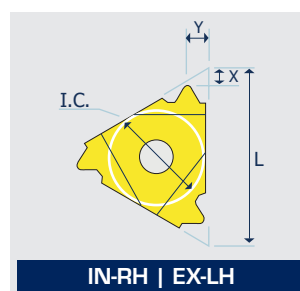
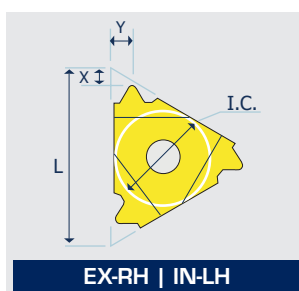
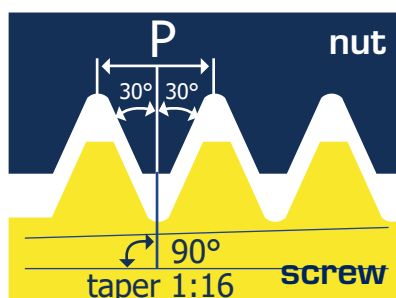
1.1.13 WHITWORTH MULTITOOTH



Pitch TPI	L	I.C. in	Number of Teeth	EXTERNAL		INTERNAL		X	Y
				Ordering Code	Anvil	Ordering Code	Anvil		
14	16	3/8	2	16 ER 14 W 2M	YE16M	16 IR 14 W 2M	YI16M	1.7	2.7
14	22	1/2	3	22 ER 14 W 3M	YE22M	22 IR 14 W 3M	YI22M	2.8	4.5
11	22	1/2	2	22 ER 11 W 2M	YE22M	22 IR 11 W 2M	YI22M	2.3	3.4

Order example: 16 ER 14 W 2M FXA
 For recommended number of passes see page 80

1.1.14 NPT | & Type B



Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
			Right Hand	Left Hand	Right Hand	Left Hand		
27	6	5/32	ULTRA MINIATURE →		*06 IR 27 NPT	*06 IL 27 NPT	0.6	0.6
27	8	3/16	MINIATURE →		*08 IR 27 NPT	*08 IL 27 NPT	0.6	0.6
18	8	3/16			*08 IR 18 NPT	*08 IL 18 NPT	0.6	0.6
27	11	1/4	11 ER 27 NPT	11 EL 27 NPT	11 IR 27 NPT	11 IL 27 NPT	0.7	0.8
18	11	1/4	11 ER 18 NPT	11 EL 18 NPT	11 IR 18 NPT	11 IL 18 NPT	0.8	1.0
14	11	1/4	11 ER 14 NPT	11 EL 14 NPT	11 IR 14 NPT	11 IL 14 NPT	0.8	1.0
27	16	3/8	16 ER 27 NPT	16 EL 27 NPT	16 IR 27 NPT	16 IL 27 NPT	0.7	0.8
18	16	3/8	16 ER 18 NPT	16 EL 18 NPT	16 IR 18 NPT	16 IL 18 NPT	0.8	1.0
14	16	3/8	16 ER 14 NPT	16 EL 14 NPT	16 IR 14 NPT	16 IL 14 NPT	0.9	1.2
11.5	16	3/8	16 ER 11.5 NPT	16 EL 11.5 NPT	16 IR 11.5 NPT	16 IL 11.5 NPT	1.1	1.5
8	16	3/8	16 ER 8 NPT	16 EL 8 NPT	16 IR 8 NPT	16 IL 8 NPT	1.3	1.8

* Only available in FXCL en FXA grades
Order example: 06 IR 27 NPT FXA



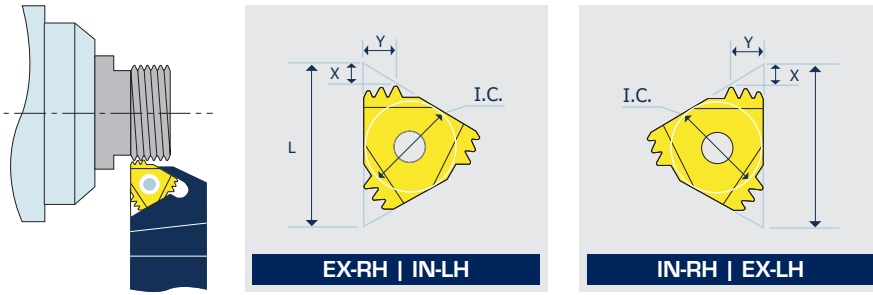
Type B

Ground profile with sintered chip-breaker

Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
			Right Hand	Right Hand	Right Hand			
18	11	1/4		11 IR B 18 NPT		0.8	0.9	
18	16	3/8	16 ER B 18 NPT	16 IR B 18 NPT		0.8	1.0	
14	16	3/8	16 ER B 14 NPT	16 IR B 14 NPT		0.9	1.2	
11.5	16	3/8	16 ER B 11.5 NPT	16 IR B 11.5 NPT		1.1	1.5	
8	16	3/8	16 ER B 8 NPT	16 IR B 8 NPT		1.3	1.8	

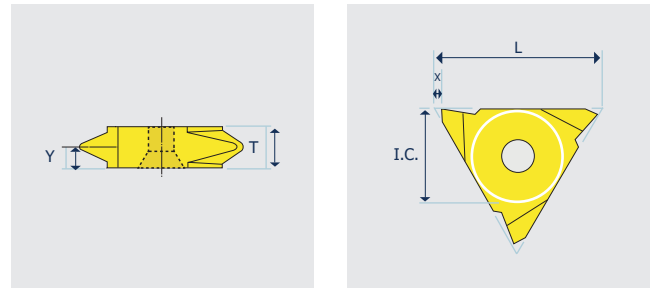
Order example: 16 IR B 18 NPT FXA
For carbide grade and cutting speed see page 78 & 79

1.1.15 NPT | Multitooth



Pitch TPI	L	I.C. in	Number of Teeth	EXTERNAL		INTERNAL		X	Y
				Ordering Code	Anvil	Ordering Code	Anvil		
14	16	3/8	2	16 ER 14 NPT 2M	YE16M	16 IR 14 NPT 2M	YI16M	1.7	2.8
11.5	22	1/2	2	22 ER 11.5 NPT 2M	YE22M	22 IR 11.5 NPT 2M	YI22M	2.3	3.5
11.5	27	5/8	3	27 ER 11.5 NPT 3M	YE27M	27 IR 11.5 NPT 3M	YI27M	3.3	5.5
8	27	5/8	2	27 ER 8 NPT 2M	YE27M	27 IR 8 NPT 2M	YI27M	3.1	5.0

Order example: 16 ER 14 NPT 2M FXA
For recommended number of passes see page 80

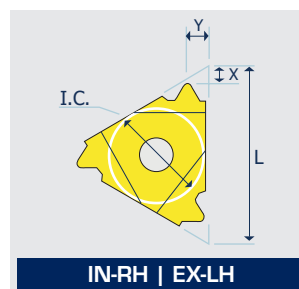
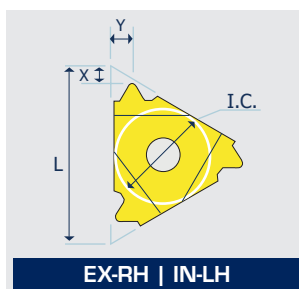
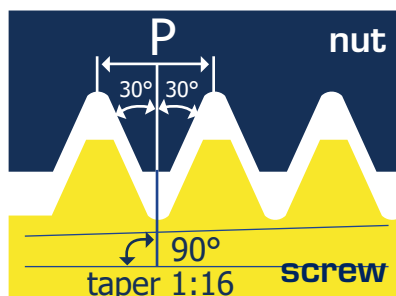


1.1.16 NPT | Vertical

Pitch TPI	L	I.C. in	EXTERNAL		X	Y	T
			Ordering Code Right Hand	Ordering Code Left Hand			
27	16	3/8	16V ER 27 NPT	16V EL 27 NPT	1.0	0.8	3.6
18	16	3/8	16V ER 18 NPT	16V EL 18 NPT	1.0	1.0	3.6
14	16	3/8	16V ER 14 NPT	16V EL 14 NPT	1.0	1.2	3.6
11.5	16	3/8	16V ER 11.5 NPT	16V EL 11.5 NPT	1.0	1.5	3.6

Order example: 16V ER 14 NPT FXA
For carbide grade and cutting speed see page 78 & 79

1.1.17 NPTF | Dryseal & Type B



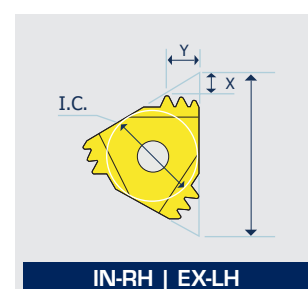
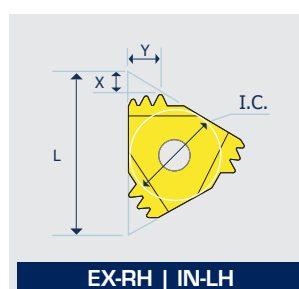
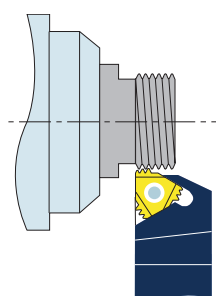
Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
			Right Hand	Left Hand	Right Hand	Left Hand		
			27	6	5/32	ULTRA MINIATURE →		
27	8	3/16	MINIATURE →		*08 IR 27 NPTF	*08 IL 27 NPTF	0.6	0.6
18	8	3/16			*08 IR 18 NPTF	*08 IL 18 NPTF	0.6	0.6
27	11	1/4	11 ER 27 NPTF	11 EL 27 NPTF	11 IR 27 NPTF	11 IL 27 NPTF	0.7	0.7
18	11	1/4	11 ER 18 NPTF	11 EL 18 NPTF	11 IR 18 NPTF	11 IL 18 NPTF	0.8	1.0
14	11	1/4	11 ER 14 NPTF	11 EL 14 NPTF	11 IR 14 NPTF	11 IL 14 NPTF	0.8	1.0
27	16	3/8	16 ER 27 NPTF	16 EL 27 NPTF	16 IR 27 NPTF	16 IL 27 NPTF	0.7	0.7
18	16	3/8	16 ER 18 NPTF	16 EL 18 NPTF	16 IR 18 NPTF	16 IL 18 NPTF	0.8	1.0
14	16	3/8	16 ER 14 NPTF	16 EL 14 NPTF	16 IR 14 NPTF	16 IL 14 NPTF	0.9	1.2
11.5	16	3/8	16 ER 11.5 NPTF	16 EL 11.5 NPTF	16 IR 11.5 NPTF	16 IL 11.5 NPTF	1.1	1.5
8	16	3/8	16 ER 8 NPTF	16 EL 8 NPTF	16 IR 8 NPTF	16 IL 8 NPTF	1.3	1.8

* Only available in FXCL en FXA grades
Order example: 06 IR 27 NPTF FXA

Type B

Ground profile with sintered chip-breaker

Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		X	Y
			Right Hand	Left Hand		
			18	11		

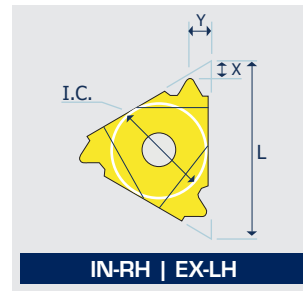
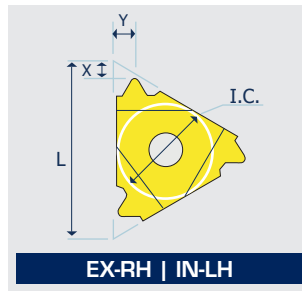
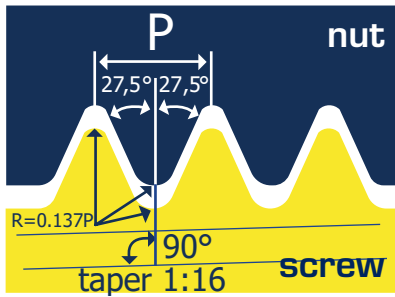


MULTITOOTH

Pitch TPI	L	I.C. in	Number of Teeth	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
				Anvil	Anvil	Anvil	Anvil		
				11.5	22	1/2	2		

Order example: 22 ER 11.5 NPTF 2M FXA
For carbide grade and cutting speed see page 78 & 79

1.1.18 BSPT | & Type B

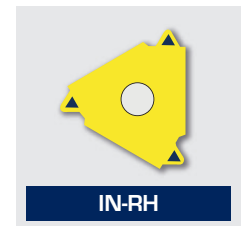
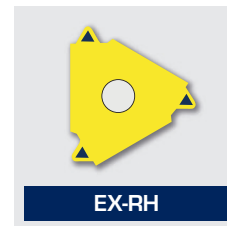


Pitch TPI	L	I.C. in	EXTERNAL		INTERNAL		X	Y
			Ordering Code		Ordering Code			
			Right Hand	Left Hand	Right Hand	Left Hand		
28	6	5/32	ULTRA MINIATURE →		*06 IR 28 BSPT	*06 IL 28 BSPT	0.7	0.6
28	8	3/16	MINIATURE →		*08 IR 28 BSPT	*08 IL 28 BSPT	0.6	0.6
19	8	3/16			*08 IR 19 BSPT	*08 IL 19 BSPT	0.6	0.6
28	11	1/4			11 IR 28 BSPT	11 IL 28 BSPT	0.6	0.6
19	11	1/4			11 IR 19 BSPT	11 IL 19 BSPT	0.8	0.9
14	11	1/4			11 IR 14 BSPT	11 IL 14 BSPT	0.9	1.0
11	11	1/4			(1)11 IR 11 BSPT	(1) 11 IL 11 BSPT	0.9	1.2
28	16	3/8	16 ER 28 BSPT	16 EL 28 BSPT	16 IR 28 BSPT	16 IL 28 BSPT	0.6	0.6
19	16	3/8	16 ER 19 BSPT	16 EL 19 BSPT	16 IR 19 BSPT	16 IL 19 BSPT	0.8	0.9
14	16	3/8	16 ER 14 BSPT	16 EL 14 BSPT	16 IR 14 BSPT	16 IL 14 BSPT	1.0	1.2
11	16	3/8	16 ER 11 BSPT	16 EL 11 BSPT	16 IR 11 BSPT	16 IL 11 BSPT	1.1	1.5

* Available only in FXCL and FXA grades

Order example: 06 IR 28 BSPT FXA

(1) A special holder is required or a standard holder can be amended by customer.



Type B

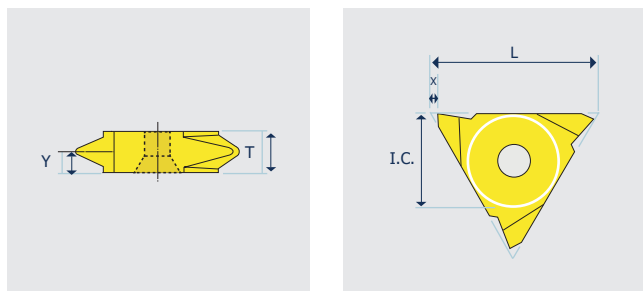
Ground profile with sintered chip-breaker

Pitch TPI	L	I.C. in	EXTERNAL		INTERNAL		X	Y
			Ordering Code		Ordering Code			
			Right Hand		Right Hand			
19	11	1/4			11 IR B 19 BSPT		0.8	0.9
19	16	3/8	16 ER B 19 BSPT				1.0	1.1
14	16	3/8	16 ER B 14 BSPT		16 IR B 14 BSPT		1.2	1.0
11	16	3/8	16 ER B 11 BSPT		16 IR B 11 BSPT		1.5	1.1

Order example: 11 IR B 19 BSPT FXA

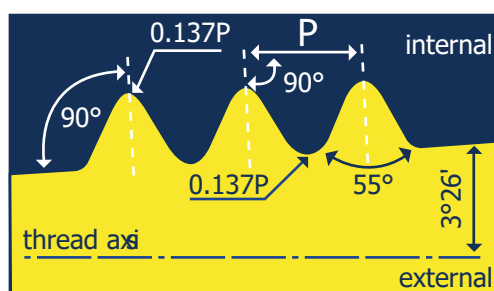
For carbide grade and cutting speed see page 78 & 79

1.1.19 BSPT | Vertical & DIN 477



Pitch TPI	L	I.C. in	EXTERNAL	INTERNAL	X	Y	T
			Ordering Code Right Hand	Ordering Code Left Hand			
28	16	3/8	16V ER 28 BSPT	16V EL 28 BSPT	1.0	0.6	3.6
19	16	3/8	16V ER 19 BSPT	16V EL 19 BSPT	1.0	0.9	3.6
14	16	3/8	16V ER 14 BSPT	16V EL 14 BSPT	1.0	1.2	3.6
11	16	3/8	16V ER 11 BSPT	16V EL 11 BSPT	1.0	1.5	3.6

Order example: 16V ER 28 BSPT FXA



DIN 477

Pitch TPI	L	I.C. in	Taper Ratio	EXTERNAL	INTERNAL	X	Y	Thread Designation
				Ordering Code Right Hand	Ordering Code Right Hand			
14	16	3/8	3/25	16 ER 14 DIN477		1.0	1.2	W19.8x1/14 keg (Ext.)
14	11	1/4	3/25		* 11 IR 14 DIN477	0.9	1.0	W19.8x1/14 keg (Int.)
14	16	3/8	3/25	16 ER 14 DIN477	** 16 IR 14 DIN477	1.0	1.2	W28.8x1/14 keg
14	16	3/8	3/25	16 ER 14 DIN477	*** 16 IR 14 DIN477	1.0	1.2	W31.3x1/14 keg

* Holder to use: SIRO010H11/SIRO010K11

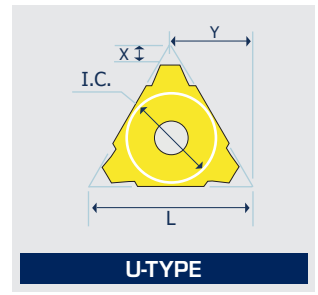
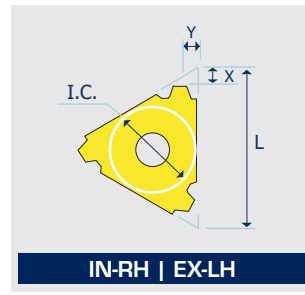
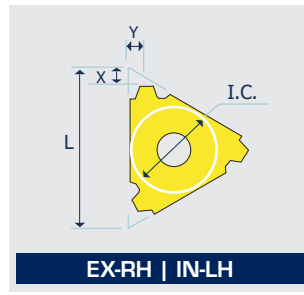
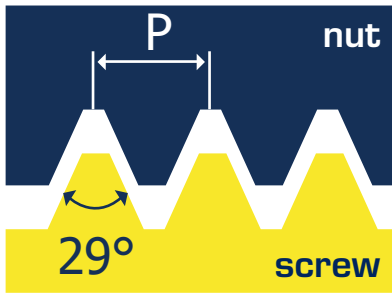
** Holder to use: SIRO016P16

*** Holder to use: SIRO020P16

Order example: 16 ER 14 DIN477 FXA

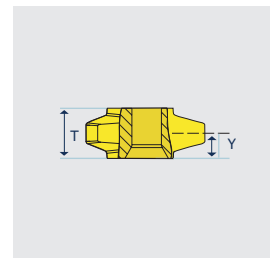
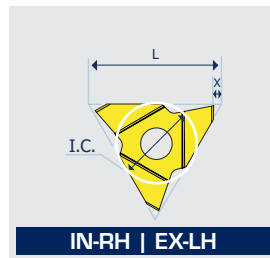
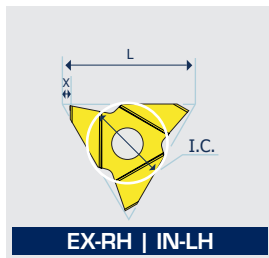
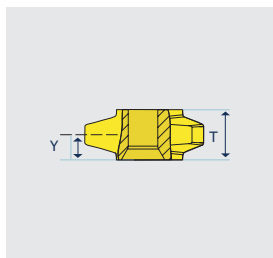
For carbide grade and cutting speed see page 78 & 79

1.1.20 ACME | & ACME Vertical



Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
			Right Hand	Left Hand	Right Hand	Left Hand		
			16	8	3/16	ULTRA MINIATURE		
14	8U	3/16U			*08U IR/L 14 ACME		0.8	4.0
12	8U	3/16U	MINIATURE		*08U IR/L 12 ACME		0.8	4.0
10	8U	3/16U			*08U IR/L 10 ACME		0.8	4.0
16	11	1/4	11 ER 16 ACME	11 EL 16 ACME	11 IR 16 ACME	11 IL 16 ACME	0.9	1.0
16	16	3/8	16 ER 16 ACME	16 EL 16 ACME	16 IR 16 ACME	16 IL 16 ACME	0.9	1.0
14	16	3/8	16 ER 14 ACME	16 EL 14 ACME	16 IR 14 ACME	16 IL 14 ACME	1.0	1.2
12	16	3/8	16 ER 12 ACME	16 EL 12 ACME	16 IR 12 ACME	16 IL 12 ACME	1.1	1.2
10	16	3/8	16 ER 10 ACME	16 EL 10 ACME	16 IR 10 ACME	16 IL 10 ACME	1.3	1.3
8	16	3/8	16 ER 8 ACME	16 EL 8 ACME	16 IR 8 ACME	16 IL 8 ACME	1.5	1.5
6	16	3/8	(1) 16 ER 6 ACME	(1) 16 EL 6 ACME	(1) 16 IR 6 ACME	(1) 16 IL 6 ACME	1.7	1.8
6	22	1/2	22 ER 6 ACME	22 EL 6 ACME	22 IR 6 ACME	22 IL 6 ACME	1.8	2.1
5	22	1/2	22 ER 5 ACME	22 EL 5 ACME	22 IR 5 ACME	22 IL 5 ACME	2.0	2.3
4	22	1/2	(1) 22 ER 4 ACME	(1) 22 EL 4 ACME	(1) 22 IR 4 ACME	(1) 22 IL 4 ACME	2.1	2.2
4	22U	1/2U	22U ER/L 4 ACME		22U IR/L 4 ACME		2.3	11.0
4	27	5/8	27 ER 4 ACME	27 EL 4 ACME	27 IR 4 ACME	27 IL 4 ACME	2.3	2.7
3	27U	5/8U	27U ER/L 3 ACME		27U IR/L 3 ACME		2.8	13.7
2	33U	3/4U	33U ER/L 2 ACME		33U IR/L 2 ACME		4.3	16.9

** One cutting edge * Available only in FXCL and FXA grades Order example: 16 ER 16 ACME FXA
 (1) A special holder is required or a standard holder can be amended by customer.



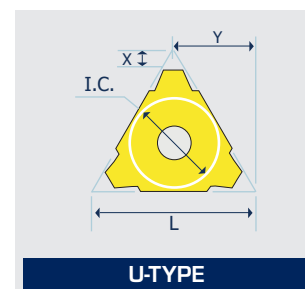
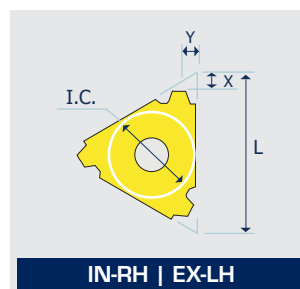
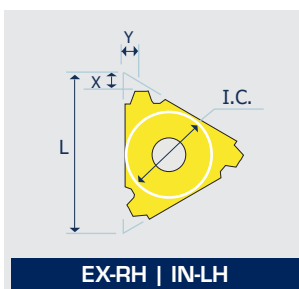
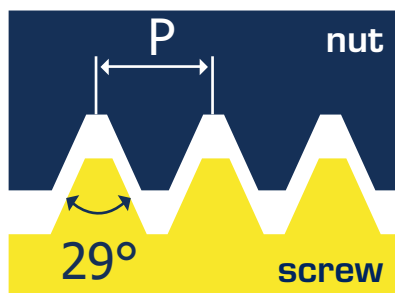
ACME VERTICAL

Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		X	Y	T	INTERNAL Ordering Code		X	Y	T
			Right Hand	Left Hand				Right Hand	Left Hand			
			*3.5	27				5/8	27V ER 3.5 ACME			
*3	27	5/8	27V ER 3 ACME		1.8	5.0	10.4	27V IR 3 ACME		1.8	4.6	10.4
**2	27	5/8	27V ER 2 ACME	27V EL 2 ACME	1.8	5.0	10.4	27V IR 2 ACME	27V IL 2 ACME	1.8	5.0	10.4

* Minimum bore: \varnothing 55 mm
 ** Minimum bore: \varnothing 76 mm

Order example: 27V ER 3.5 ACME FXA
 For carbide grade and cutting speed see page 78 & 79

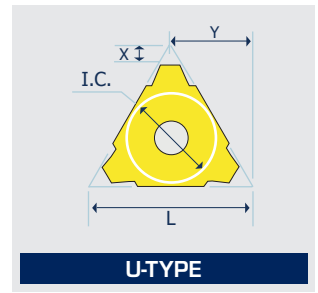
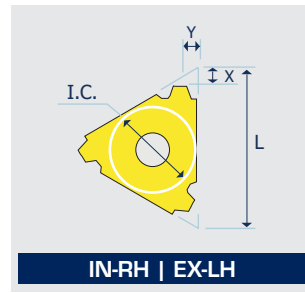
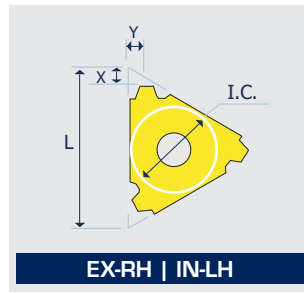
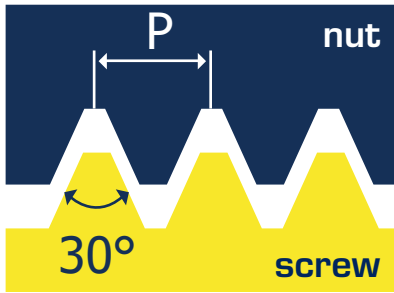
1.1.21 STUB ACME



Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
			Right Hand	Left Hand	Right Hand	Left Hand		
			ULTRA MINIATURE		MINIATURE			
16	8	3/16	ULTRA MINIATURE	→	**08 IR 16 STACME	**08 IL 16 STACME	0.6	0.6
14	8U	3/16U	MINIATURE →		*08U IR/L 14 STACME		0.8	4.0
12	8U	3/16U			*08U IR/L 12 STACME		0.9	4.0
10	8U	3/16U			*08U IR/L 10 STACME		1.0	4.0
16	11	1/4	11ER 16 STACME	11 EL 16 STACME			1.0	1.0
16	16	3/8	16 ER 16 STACME	16 EL 16 STACME	16 IR 16 STACME	16 IL 16 STACME	1.0	1.0
14	16	3/8	16 ER 14 STACME	16 EL 14 STACME	16 IR 14 STACME	16 IL 14 STACME	1.1	1.1
12	16	3/8	16 ER 12 STACME	16 EL 12 STACME	16 IR 12 STACME	16 IL 12 STACME	1.2	1.2
10	16	3/8	16 ER 10 STACME	16 EL 10 STACME	16 IR 10 STACME	16 IL 10 STACME	1.3	1.3
8	16	3/8	16 ER 8 STACME	16 EL 8 STACME	16 IR 8 STACME	16 IL 8 STACME	1.5	1.5
6	16	3/8	16 ER 6 STACME	16 EL 6 STACME	16 IR 6 STACME	16 IL 6 STACME	1.8	1.8
6	22	1/2	22 ER 6 STACME	22 EL 6 STACME	22 IR 6 STACME	22 IL 6 STACME	1.8	1.8
5	22	1/2	22 ER 5 STACME	22 EL 5 STACME	22 IR 5 STACME	22 IL 5 STACME	2.0	2.3
4	22	1/2	22 ER 4 STACME	22 EL 4 STACME	22 IR 4 STACME	22 IL 4 STACME	2.3	2.4
4	22U	1/2U	22U ER/L 4 STACME		22U IR/L 4 STACME		2.5	11.0
3	22U	1/2U	22U ER/L 3 STACME		22U IR/L 3 STACME		3.3	11.0
4	27	5/8	27 ER 4 STACME	27 EL 4 STACME	27 IR 4 STACME	27 IL 4 STACME	2.3	2.4
3	27	5/8U	27 ER 3 STACME	27 EL 3 STACME	27 IR 3 STACME	27 IL 3 STACME	2.8	2.9
2	33U	3/4U	33U ER/L 2 STACME		33U IR/L 2 STACME		5.0	16.9

* Available only in FXCL and FXA grades
 ** One cutting edge
 Order example: 08 IR 16 STACME FXA
 For carbide grade and cutting speed see page 78 & 79

1.1.22 TRAPEZ DIN 103 | & DIN 103 vertical



Pitch mm	L	I.C. in	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
			Right Hand	Left Hand	Right Hand	Left Hand		
			1.5	8	3/16	ULTRA MINIATURE		
2.0	8U	3/16U	MINIATURE		*08U IR/L 2 TR		0.9	4.0
1.5	16	3/8	16 ER 1.5 TR	16 EL 1.5 TR			1.0	1.1
2.0	16	3/8	16 ER 2 TR	16 EL 2 TR	16 IR 2 TR	16 IL 2 TR	1.0	1.3
3.0	16	3/8	16 ER 3 TR	16 EL 3 TR	16 IR 3 TR	16 IL 3 TR	1.3	1.5
4.0	16	3/8	(1) 16 ER 4 TR	(1) 16 EL 4 TR	(2) 16 IR 4 TR	(2) 16 IL 4 TR	1.3	1.5
5.0	16U	3/8U			***16U IR/L 5 TR		2.3	8.2
4.0	22	1/2	22 ER 4 TR	22 EL 4 TR	22 IR 4 TR	22 IL 4 TR	1.8	1.9
5.0	22	1/2	22 ER 5 TR	22 EL 5 TR	22 IR 5 TR	22 IL 5 TR	2.0	2.4
6.0	22	1/2	(1) 22 ER 6 TR	(1) 22 EL 6 TR	(1) 22 IR 6 TR	(1) 22 IL 6 TR	2.0	2.4
6.0	22U	1/2U	22U ER/L 6 TR		22U IR/L 6 TR		2.0	11.0
7.0	22U	1/2U	22U ER/L 7 TR		22U IR/L 7 TR		2.3	11.0
(3) 7.0	22U	1/2U			(3) 22U IR/L 7 TR 40		2.6	11.0
8.0	22U	1/2U	22U ER/L 8 TR		22U IR/L 8 TR		2.5	11.0
6.0	27	5/8	27 ER 6 TR	27 EL 6 TR	27 IR 6 TR	27 IL 6 TR	2.3	2.7
7.0	27	5/8	27 ER 7 TR	27 EL 7 TR	27 IR 7 TR	27 IL 7 TR	2.2	2.6
8.0	27U	5/8U	27U ER/L 8 TR		27U IR/L 8 TR		2.5	13.7
9.0	27U	5/8U	27U ER/L 9 TR		27U IR/L 9 TR		3.0	13.7
10.0	27U	5/8U	**27U ER/L 10 TR		**27U IR/L 10 TR		3.2	13.7
12.0	33U	3/4U	33U ER/L 12 TR		33U IR/L 12 TR		3.9	16.9

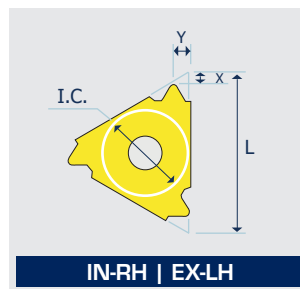
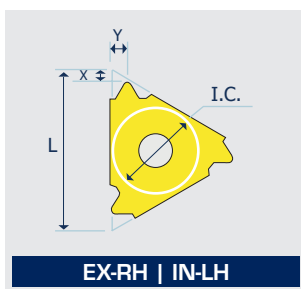
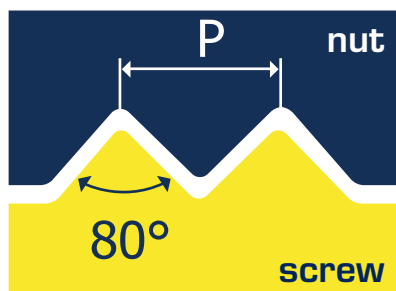
- * Available only in FXCL and FXA grades
- ** One cutting edge
- *** To be used only with holder SIR/L0014M16UB on 71
- Order example: 22 IR 5 TR FXA
- (1) A special holder is required or a standard holder can be amended by customer.
- (2) A special holder is required or a standard holder can be amended by customer or to be used with holders: SIR/L00121L16B; SIR/L0014L16B
- (3) Only for Tr 40x 7.0. To be used only with holder SIR/L0025S22UB

DIN 103 vertical

Pitch mm	L	I.C. in	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y	T
			Right Hand	Left Hand	Right Hand	Left Hand			
			* 9	27	5/8	27V ER 9 TR			
* 10	27	5/8	27V ER 10 TR	27V EL 10 TR	27V IR 10 TR	27V IL 10 TR	1.8	5.2	10.4
** 12	27	5/8	27V ER 12 TR	27V EL 12 TR	27V IR 12 TR	27V IL 12 TR	1.8	5.2	10.4

- * Minimum bore: Ø 65 mm
- ** 8 Minimum bore: Ø 73 mm
- Order example: 27V ER 9 TR FXA
- For carbide grade and cutting speed see page 78 & 79

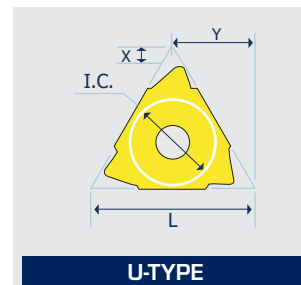
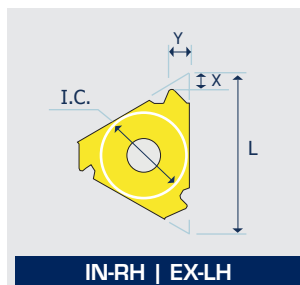
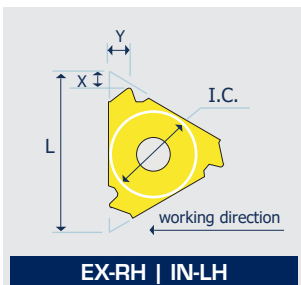
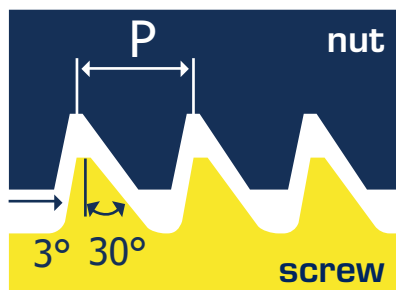
1.1.23 PG | DIN 40430



Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
			Right Hand	Standard	Right Hand	Standard		
20	8	3/16	ULTRA MINIATURE	→	*08 IR 20 PG	(PG 7)	0.6	0.7
18	11	1/4			11 IR 18 PG	(PG 9)	0.8	0.9
20	16	3/8	16 ER 20 PG	(PG 7)			0.7	0.8
18	16	3/8	16 ER 18 PG	(PG 9, 11, 13.5, 16)	16 IR 18 PG	(PG 11, 13.5, 16)	0.8	0.9
16	16	3/8	16 ER 16 PG	(PG 21, 29, 36, 42, 48)	16 IR 16 PG	(PG 21, 29, 36, 42, 48)	0.8	1.0

* Only available in FXCL and FXA grades
Order example: 16 ER 20 PG FXA

1.1.24 SAGENWINDE | DIN 513



IMPORTANT NOTE!

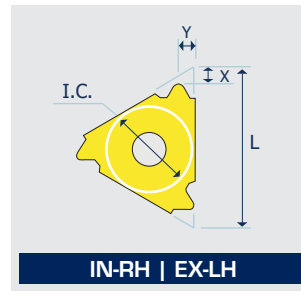
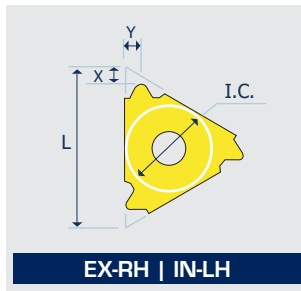
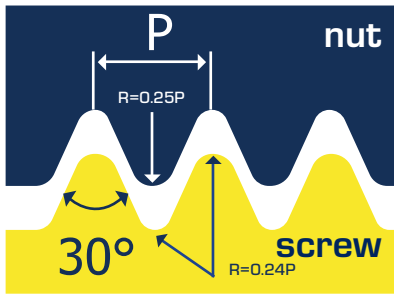
In Combidex standard execution, the flank with the large angle is the leading edge.
If otherwise required, please specify in your order.

Pitch mm	L	I.C. in	EXTERNAL Ordering Code		X	Y	INTERNAL Ordering Code		X	Y
			Right Hand	Left Hand			Right Hand	Left Hand		
2.0	16	3/8	16 ER 2 SAGE	16 EL 2 SAGE	1.1	1.6	16 IR 2 SAGE	16 IL 2 SAGE	1.2	1.7
**3.0	22	1/2	22 ER 3 SAGE	22 EL 3 SAGE	1.5	2.4	22 IR 3 SAGE	22 IL 3 SAGE	1.9	2.9
**4.0	22	1/2	22 ER 4 SAGE	22 EL 4 SAGE	1.9	3.1	22 IR 4 SAGE	22 IL 4 SAGE	2.3	3.5
*5.0	22U	1/2U	22U ER 5 SAGE	22U EL 5 SAGE	1.2	11.6	22U IR 5 SAGE	22U IL 5 SAGE	1.9	11.7
*6.0	22U	1/2U	22U ER 6 SAGE	22U EL 6 SAGE	1.2	11.7	22U IR 6 SAGE	22U IL 6 SAGE	2.1	11.9

* Requires a special anvil YER 22U-1.5 SAGE 5/6, YEL 22U-1.5 SAGE 5/6, YIR 22U-1.5 SAGE 5/6, YIL 22U-1.5 SAGE 5/6
** Requires a special anvil YER 22-1.5 SAGE 3/4, YEL 22-1.5 SAGE 3/4, YIR 22-1.5 SAGE 3/4, YIL 22-1.5 SAGE 3/4

Order example: 22 IR 4 SAGE FXA
For carbide grade and cutting speed see page 78 & 79

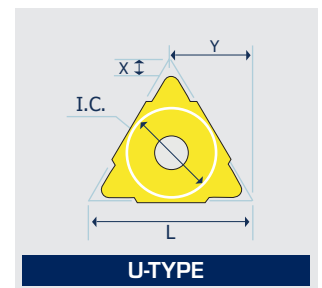
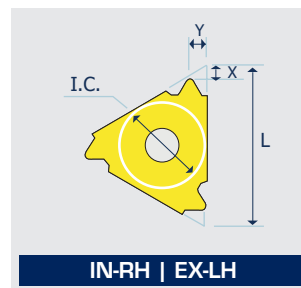
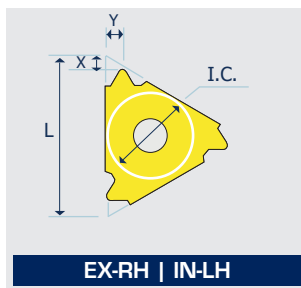
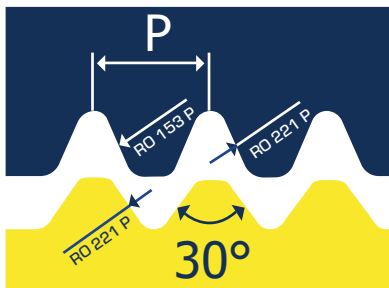
1.1.25 ROUND | DIN 405



Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		X	Y	INTERNAL Ordering Code		X	Y
			Right Hand	Left Hand			Right Hand	Left Hand		
			10	16			3/8	16 ER 10 RD		
8	16	3/8	16 ER 8 RD	16 EL 8 RD	1.4	1.3	16 IR 8 RD	16 IL 8 RD	1.4	1.4
6	16	3/8	16 ER 6 RD	16 EL 6 RD	1.5	1.7	16 IR 6 RD	16 IL 6 RD	1.4	1.5
6	22	1/2	22 ER 6 RD	22 EL 6 RD	1.5	1.7	22 IR 6 RD	22 IL 6 RD	1.5	1.7
4	22	1/2	22 ER 4 RD	22 EL 4 RD	2.2	2.3	22 IR 4 RD	22 IL 4 RD	2.2	2.3
4	27	5/8	27 ER 4 RD	27 EL 4 RD	2.2	2.3	27 IR 4 RD	27 IL 4 RD	2.2	2.3

Order example: 16 ER 10 RD FXA

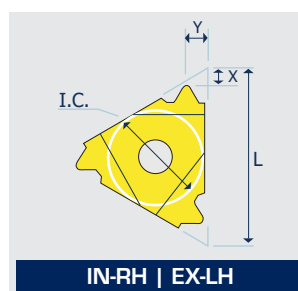
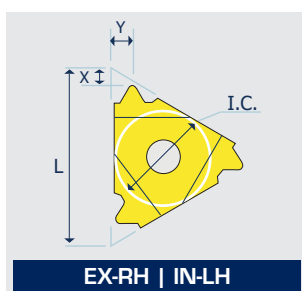
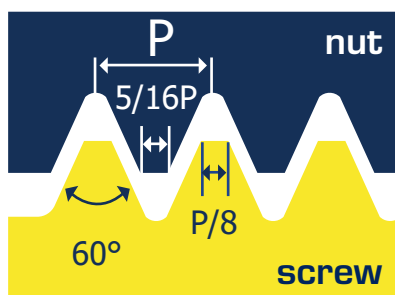
1.1.26 ROUND | DIN 20400



Pitch mm	L	I.C. in	EXTERNAL Ordering Code		X	Y
			Right Hand	Right Hand		
4.0	22	1/2	22 ER 4.0 RD 20400	22 IR 4.0 RD 20400	1.4	1.4
5.0	22	1/2	22 ER 5.0 RD 20400	22 IR 5.0 RD 20400	1.7	1.8
6.0	22	1/2	22 ER 6.0 RD 20400	22 IR 6.0 RD 20400	1.7	2.0
8.0	27U	5/8U	*27U E/I/R/L 8.0 RD 20400		3.0	13.7
10.0	27U	5/8U	*27U E/I/R/L 10.0 RD 20400		3.4	13.7
12.0	33U	3/4U	*33U E/I/R/L 12.0 RD 20400		4.3	16.9

* Same insert for internal and External Right Hand Thread
 Order example: 22 ER 4.0 RD 20400 FXA
 For carbide grade cutting speed see page 78 & 79

1.1.27 UNJ | UNJC, UNJF, UNJEF, UNJS



Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
			Right Hand	Left Hand	Right Hand	Left Hand		
28	08	3/16			*08 IR 28 UNJ	*08 IL 28 UNJ	0.6	0.6
24	08	3/16			*08 IR 24 UNJ	*08 IL 24 UNJ	0.6	0.6
20	08	3/16			*08 IR 20 UNJ	*08 IL 20 UNJ	0.6	0.7
18	08	3/16			*08 IR 18 UNJ	*08 IL 18 UNJ	0.6	0.7
13	08U	3/16U	"U" MINIATURE →		*08 UIR/L 13 UNJ		0.9	4.0
48	11	1/4	11 ER 48 UNJ	11 EL 48 UNJ	11 IR 48 UNJ	11 IL 48 UNJ	0.6	0.6
44	11	1/4	11 ER 44 UNJ	11 EL 44 UNJ	11 IR 44 UNJ	11 IL 44 UNJ	0.6	0.6
40	11	1/4	11 ER 40 UNJ	11 EL 40 UNJ	11 IR 40 UNJ	11 IL 40 UNJ	0.6	0.6
36	11	1/4	11 ER 36 UNJ	11 EL 36 UNJ	11 IR 36 UNJ	11 IL 36 UNJ	0.6	0.6
32	11	1/4	11 ER 32 UNJ	11 EL 32 UNJ	11 IR 32 UNJ	11 IL 32 UNJ	0.6	0.6
28	11	1/4	11 ER 28 UNJ	11 EL 28 UNJ	11 IR 28 UNJ	11 IL 28 UNJ	0.6	0.6
24	11	1/4	11 ER 24 UNJ	11 EL 24 UNJ	11 IR 24 UNJ	11 IL 24 UNJ	0.7	0.8
20	11	1/4	11 ER 20 UNJ	11 EL 20 UNJ	11 IR 20 UNJ	11 IL 20 UNJ	0.8	0.9
18	11	1/4	11 ER 18 UNJ	11 EL 18 UNJ	11 IR 18 UNJ	11 IL 18 UNJ	0.8	1.0
16	11	1/4	11 ER 16 UNJ	11 EL 16 UNJ	11 IR 16 UNJ	11 IL 16 UNJ	0.8	1.0
14	11	1/4	11 ER 14 UNJ	11 EL 14 UNJ	11 IR 14 UNJ	11 IL 14 UNJ	0.9	1.0
48	16	3/8	16 ER 48 UNJ	16 EL 48 UNJ	16 IR 48 UNJ	16 IL 48 UNJ	0.6	0.6
44	16	3/8	16 ER 44 UNJ	16 EL 44 UNJ	16 IR 44 UNJ	16 IL 44 UNJ	0.6	0.6
40	16	3/8	16 ER 40 UNJ	16 EL 40 UNJ	16 IR 40 UNJ	16 IL 40 UNJ	0.6	0.6
36	16	3/8	16 ER 36 UNJ	16 EL 36 UNJ	16 IR 36 UNJ	16 IL 36 UNJ	0.6	0.6
32	16	3/8	16 ER 32 UNJ	16 EL 32 UNJ	16 IR 32 UNJ	16 IL 32 UNJ	0.6	0.6
28	16	3/8	16 ER 28 UNJ	16 EL 28 UNJ	16 IR 28 UNJ	16 IL 28 UNJ	0.6	0.6
24	16	3/8	16 ER 24 UNJ	16 EL 24 UNJ	16 IR 24 UNJ	16 IL 24 UNJ	0.7	0.8
20	16	3/8	16 ER 20 UNJ	16 EL 20 UNJ	16 IR 20 UNJ	16 IL 20 UNJ	0.8	0.9
18	16	3/8	16 ER 18 UNJ	16 EL 18 UNJ	16 IR 18 UNJ	16 IL 18 UNJ	0.8	1.0
16	16	3/8	16 ER 16 UNJ	16 EL 16 UNJ	16 IR 16 UNJ	16 IL 16 UNJ	0.8	1.0
14	16	3/8	16 ER 14 UNJ	16 EL 14 UNJ	16 IR 14 UNJ	16 IL 14 UNJ	1.0	1.2
13	16	3/8	16 ER 13 UNJ	16 EL 13 UNJ	16 IR 13 UNJ	16 IL 13 UNJ	1.0	1.3
12	16	3/8	16 ER 12 UNJ	16 EL 12 UNJ	16 IR 12 UNJ	16 IL 12 UNJ	1.1	1.4
11	16	3/8	16 ER 11 UNJ	16 EL 11 UNJ	16 IR 11 UNJ	16 IL 11 UNJ	1.1	1.5
10	16	3/8	16 ER 10 UNJ	16 EL 10 UNJ	16 IR 10 UNJ	16 IL 10 UNJ	1.1	1.5
9	16	3/8	16 ER 9 UNJ	16 EL 9 UNJ	16 IR 9 UNJ	16 IL 9 UNJ	1.2	1.6
8	16	3/8	16 ER 8 UNJ	16 EL 8 UNJ	16 IR 8 UNJ	16 IL 8 UNJ	1.2	1.6

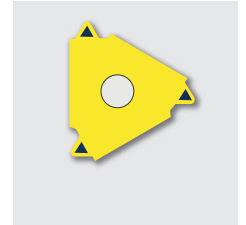
* Available only in FXA and FXCL grades
 Order example: 11 ER 48 UNJ FXA
 For carvide grade and cutting speed see page 78 & 79

1.1.28 UNJ | UNJC, UNJF, UNJEF, UNJS, Type B & multitooth

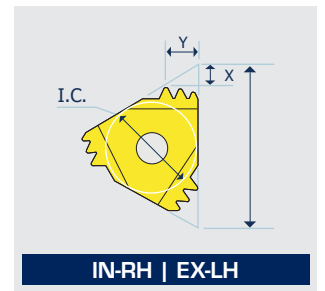
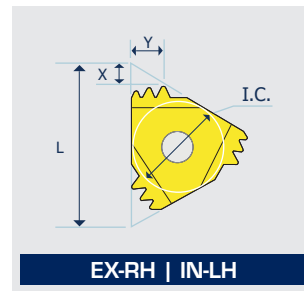
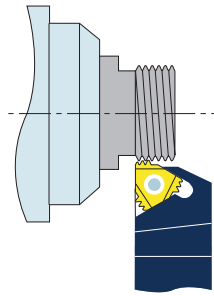
Type B

Ground profile with sintered chip-breaker

Pitch TPI	L	I.C. in	INTERNAL	X	Y
			Ordering Code Right Hand		
32	11	1/4	11 IR B 32 UNJ	0.6	0.6
28	11	1/4	11 IR B 28 UNJ	0.6	0.6
24	11	1/4	11 IR B 24 UNJ	0.6	0.6
20	11	1/4	11 IR B 20 UNJ	0.8	0.9
18	11	1/4	11 IR B 18 UNJ	0.8	0.9
16	11	1/4	11 IR B 16 UNJ	0.8	0.9
14	11	1/4	11 IR B 14 UNJ	0.8	0.9



Order example: 11 IR B 32 UNJ FXA



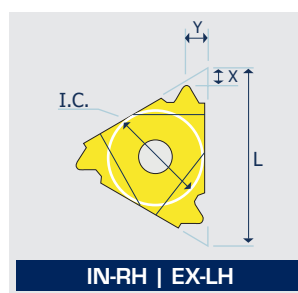
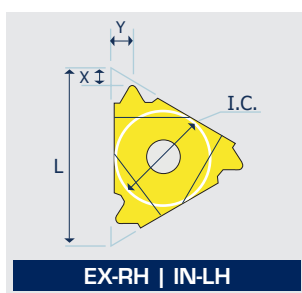
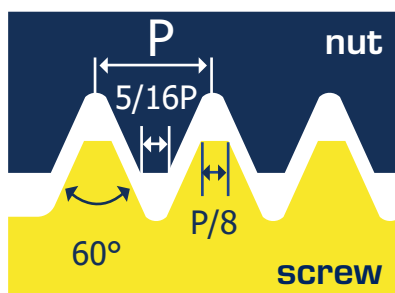
MULTITOOTH

Pitch TPI	L	I.C. in	Number of Teeth	EXTERNAL	INTERNAL		X	Y	
				Ordering Code Anvil	Ordering Code	Anvil			
16	16	3/8	2	16 ER 16 UNJ 2M	YE16M	-	-	1.6	2.4
16	22	1/2	3	22 ER 16 UNJ 3M	YE22M	-	-	2.3	3.8

Order example: 16 ER 16 UNJ 2M FXA

For carbide grade cutting speed see page 78 & 79

1.1.29 MJ | ISO 5855 & Type B



Pitch mm	L	I.C. in	EXTERNAL	INTERNAL	X	Y
			Ordering Code Right Hand	Ordering Code Right Hand		
0.5	11	1/4		11 IR 0.5 MJ	0.5	0.4
0.7	11	1/4		11 IR 0.7 MJ	0.6	0.5
0.75	11	1/4		11 IR 0.75 MJ	0.6	0.5
0.8	11	1/4		11 IR 0.8 MJ	0.6	0.6
1.0	11	1/4	11 ER 1.0 MJ	11 IR 1.0 MJ	0.7	0.8
1.25	11	1/4	11 ER 1.25 MJ	11 IR 1.25 MJ	0.8	0.9
1.5	11	1/4	11 ER 1.5 MJ	11 IR 1.5 MJ	0.8	1.0
2.0	11	1/4		11 IR 2.0 MJ	0.9	1.0
0.5	16	3/8	16 ER 0.5 MJ		0.6	0.6
0.7	16	3/8	16 ER 0.7 MJ		0.6	0.6
0.75	16	3/8	16 ER 0.75 MJ	16 IR 0.75 MJ	0.5	0.5
0.8	16	3/8	16 ER 0.8 MJ	16 IR 0.8 MJ	0.6	0.6
1.0	16	3/8	16 ER 1.0 MJ	16 IR 1.0 MJ	0.7	0.8
1.25	16	3/8	16 ER 1.25 MJ	16 IR 1.25 MJ	0.8	0.9
1.5	16	3/8	16 ER 1.5 MJ	16 IR 1.5 MJ	0.8	1.0
1.75	16	3/8	16 ER 1.75 MJ	16 IR 1.75 MJ	0.9	1.1
2.0	16	3/8	16 ER 2.0 MJ	16 IR 2.0 MJ	1.0	1.3
3.0	16	3/8	16 ER 3.0 MJ	16 IR 3.0 MJ	1.2	1.6

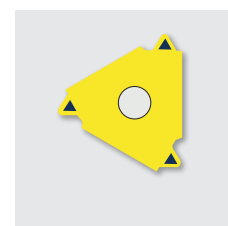
Order example: 11 IR 0.5 MJ FXA

For carbide grade cutting speed see page 78 & 79

Type B

Ground profile with sintered chip-breaker

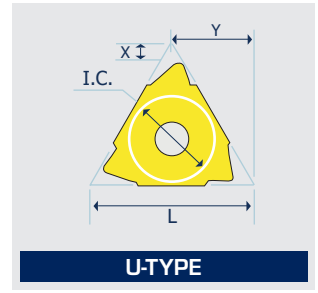
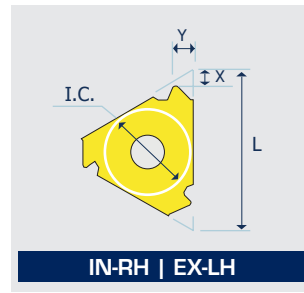
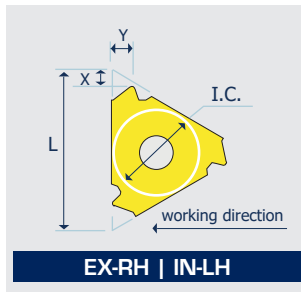
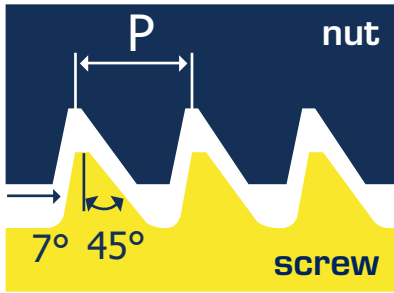
Pitch mm	L	I.C. in	INTERNAL	X	Y
			Ordering Code Right Hand		
1.0	11	1/4	11 IR B 1.0 MJ	0.6	0.6
1.5	11	1/4	11 IR B 1.5 MJ	0.8	0.9



Order example: 11 IR B 1.0 MJ FXA

For carbide grade cutting speed see page 78 & 79

1.1.30 American Buttress | Multitooth



IMPORTANT NOTE!

In Combidex standard execution, the flank with the large angle is the leading edge. If otherwise required, please specify in your order.

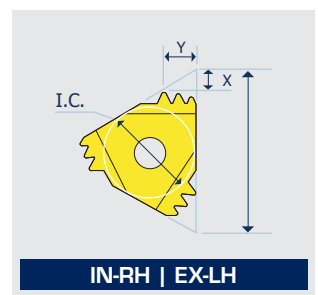
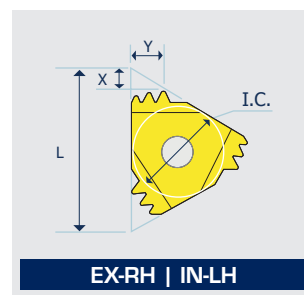
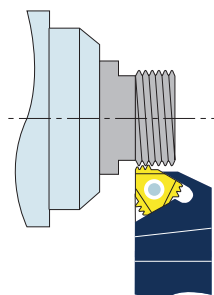
Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
			Right Hand	Left Hand	Right Hand	Left Hand		
			20	11	1/4	11 ER 20 ABUT		
16	11	1/4	11 ER 16 ABUT	11 EL 16 ABUT	11 IR 16 ABUT	11 IL 16 ABUT	1.0	1.5
20	16	3/8	16 ER 20 ABUT	16 EL 20 ABUT	16 IR 20 ABUT	16 IL 20 ABUT	1.0	1.3
16	16	3/8	16 ER 16 ABUT	16 EL 16 ABUT	16 IR 16 ABUT	16 IL 16 ABUT	1.0	1.5
12	16	3/8	16 ER 12 ABUT	16 EL 12 ABUT	16 IR 12 ABUT	16 IL 12 ABUT	1.4	2.0
10	16	3/8	16 ER 10 ABUT	16 EL 10 ABUT	16 IR 10 ABUT	16 IL 10 ABUT	1.5	2.3
8	22	1/2	22 ER 8 ABUT	22 EL 8 ABUT	22 IR 8 ABUT	22 IL 8 ABUT	2.1	3.3
6	22	1/2	22 ER 6 ABUT	22 EL 6 ABUT	22 IR 6 ABUT	22 IL 6 ABUT	2.1	3.4
(1) 4	22U	1/2U	22U ER 4 ABUT	22U EL 4 ABUT	22U IR 4 ABUT	22U IL 4 ABUT	2.3	9.5
(3) 5	27	5/8	27 ER 5 ABUT	27 EL 5 ABUT	27 IR 5 ABUT	27 IL 5 ABUT	2.75	4.5
(2) 3	27U	5/8U	27U ER 3 ABUT	27U EL 3 ABUT	27U IR 3 ABUT	27U IL 3 ABUT	3.1	11.7

Order example: 11 ER 20 ABUT FXA

Most applications requires anvil change in toolholder see page 81

- 1) Requires a special anvil YE 22U-1.5 ABUT 4, YI22U-1.5 ABUT 4
- 2) Requires a special anvil YE 27U-1.5 ABUT 3, YI27U-1.5 ABUT 3
- 3) Requires a special anvil YE 27-1.5 ABUT 5, YI27U-1.5 ABUT 5

see page 80



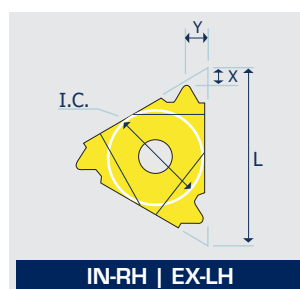
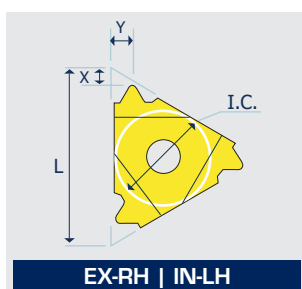
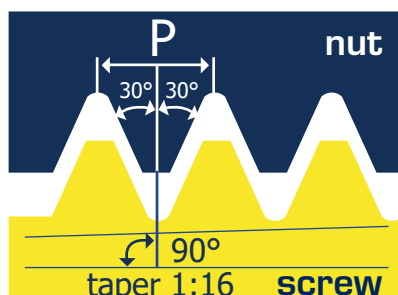
MULTITOOTH

Pitch TPI	L	I.C. in	Number of Teeth	EXTERNAL Ordering Code		INTERNAL Ordering Code		X	Y
					Anvil		Anvil		
12	22	1/2	2	22 ER 12 ABUT 2M	YE22M	22 IR 12 ABUT 2M	YI22M	2.5	4.0

Order example: 22 IR 12 ABUT 2M FXA

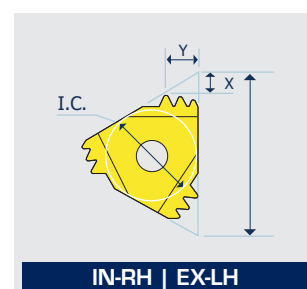
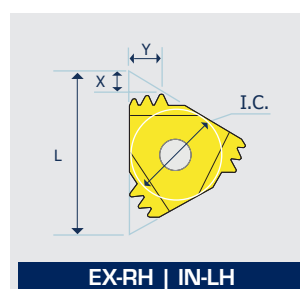
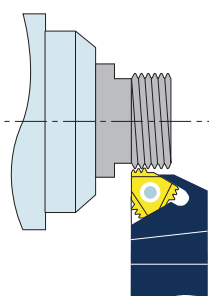
For carbide grade and cutting speed see page 78 & 79

1.1.31 THREADING TOOLS FOR THE OIL & GAS INDUSTRIES | API round



Pitch TPI	L	I.C. in	Taper IPF	EXTERNAL	INTERNAL	X	Y
				Ordering Code Right Hand	Ordering Code Right Hand		
10	16	3/8	0.75	16 ER 10 API RD	16 IR 10 API RD	1.5	1.4
8	16	3/8	0.75	16 ER 8 API RD	16 IR 8 API RD	1.3	1.6

Order example: 16 ER 10API RD PC30



MULTITOOTH

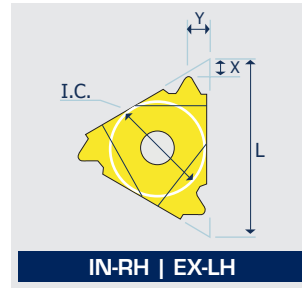
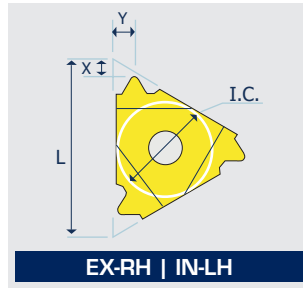
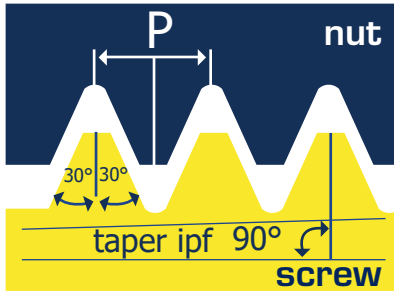
Pitch TPI	L	I.C. in	Number of Teeth	EXTERNAL	INTERNAL		X	Y	
				Ordering Code	Ordering Code	Anvil			
10	22	1/2	2	22 ER 10API RD 2M	22 IR 10API RD 2M	YE22M	YI22M	2.4	3.7
10	27	5/8	3	27 ER 10API RD 3M	27 IR 10API RD 3M	YE27M	YI27M	3.8	6.2
8	27	5/8	2	27 ER 8API RD 2M	27 IR 8API RD 2M	YE27M	YI27M	3.0	4.5

Order example: 22 ER 10API RD 2M PC30

For recommended number of passes see page 80

For carbide grade and cutting speed see page 78 & 79

1.1.32 OIL THREADS | V-0.040, V-0.038R, V-0.050, V-0.055



V-0.040

Pitch TPI	L	I.C. in	Taper IPF	EXTERNAL Ordering Code Right Hand	INTERNAL Ordering Code Right Hand	X	Y	Connection no. of size
5	22	1/2	3	22 ER 5 API 403	22 IR 5 API 403	1.8	2.5	2 3/8-4 1/2 REG

(1) V-0.038R

Pitch TPI	L	I.C. in	Taper IPF	EXTERNAL Ordering Code Right Hand	INTERNAL Ordering Code Right Hand	X	Y	Connection no. of size
4	27	5/8	2	27 ER 4 API 382	27 IR 4 API 382	2.1	2.8	NC23-NC50
4	27	5/8	3	27 ER 4 API 383	27 IR 4 API 383	2.1	2.8	NC56-NC77
4	22	1/2	2	22 ER 4 API 382	22 IR 4 API 382	2.0	2.5	NC23-NC50
4	22	1/2	3	22 ER 4 API 383	22 IR 4 API 383	2.0	2.6	NC56-NC77

Order example: 27 ER 4 API 382 FXA

(1) V-0.050

Pitch TPI	L	I.C. in	Taper IPF	EXTERNAL Ordering Code Right Hand	INTERNAL Ordering Code Right Hand	X	Y	Connection no. of size
4	27	5/8	2	27 ER 4 API 502	27 IR 4 API 502	2.0	3.0	6 5/8 REG
4	27	5/8	3	27 ER 4 API 503	27 IR 4 API 503	2.0	3.0	5 1/2, 7 5/8, 8 5/8 REG
4	22	1/2	2	22 ER 4 API 502	22 IR 4 API 502	1.9	2.7	65/8 REG
4	22	1/2	3	22 ER 4 API 503	22 IR 4 API 503	1.9	2.8	5 1/2, 7 5/8, 8 5/8 REG

Order example: 27 ER 4 API 502 FXA

V-0.055

Macaroni Tubing (MT)

American Macaroni Tubing (AMT)

American Mining Macaroni Tubing (AMMT)

Pitch TPI	L	I.C. in	Taper IPF	EXTERNAL Ordering Code Right Hand	INTERNAL Ordering Code Right Hand	X	Y	Connection no. of size
6	22	1/2	1.5	22 ER 6 API 551.5	-	2.0	1.7	NC10,NC12,NC13,NC16
6	16	3/8	1.5	-	16 IR 6 API 551.5	2.0	1.7	NC10,NC12,NC13*
6	22	1/2	1.5	-	22 IR 6 API 551.5	2.0	1.7	NC16**

* For NC10,NC12 use holder SIRO016P16CB

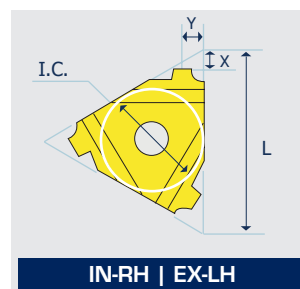
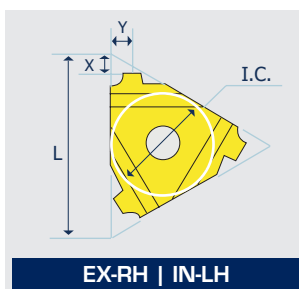
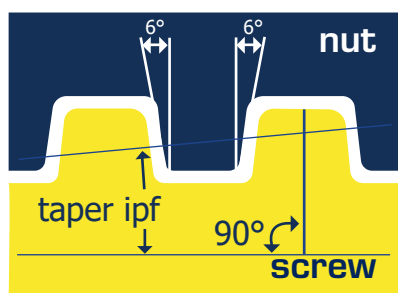
For NC13 use holders SIRO020P16/SIRO020P16B/SIRO020S16CB

** For NC16 use holder SIRO025R22

(1) For V-0.038R, V-0.050 we recommend to use size 27 for more stability.

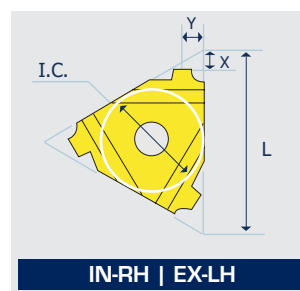
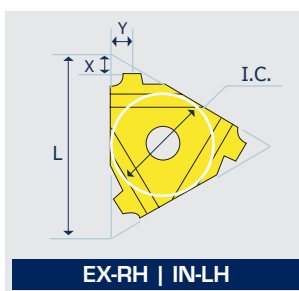
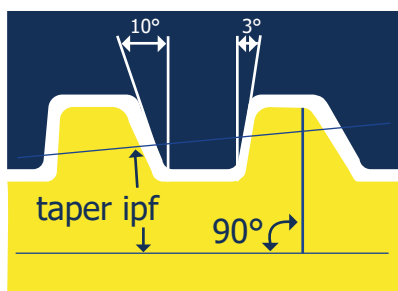
For carbide grade and cutting speed see page 78 & 79

1.1.33 OIL THREADS | Extreme - line casing, Buttress casing & VAM



Extreme - line casing

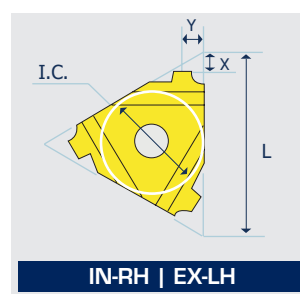
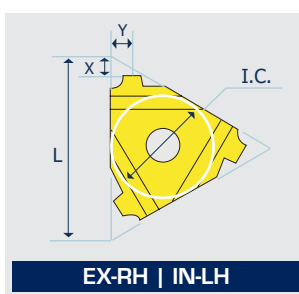
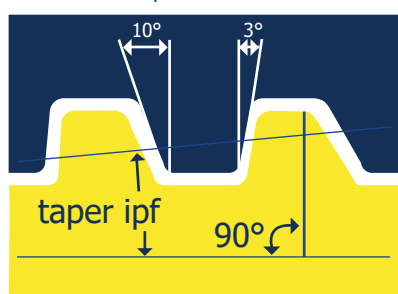
Pitch TPI	L	I.C. in	Taper IPF	EXTERNAL Ordering Code	INTERNAL Ordering Code	X	Y	Connection no. of size
				Right Hand	Right Hand			
6	22	1/2	1.50	22 ER 6 EL 1.5	22 IR 6 EL 1.5	1.9	1.9	5 - 7 5/8
5	22	1/2	1.25	22 ER 5 EL 1.25	22 IR 5 EL 1.25	2.4	2.3	8 5/8-10 3/4



Buttress casing

Pitch TPI	L	I.C. in	Taper IPF	EXTERNAL Ordering Code	INTERNAL Ordering Code	X	Y	Connection no. of size
				Right Hand	Right Hand			
5	22	1/2	0.75	22 ER 5 BUT 0.75	22 IR 5 BUT 0.75	2.2	2.4	4 1/2-13 3/8
5	22	1/2	1.00	22 ER 5 BUT 1.0	22 IR 5 BUT 1.0	2.3	2.4	16 -20

Order example: 22 IR 6 BUT 0.75 FXA



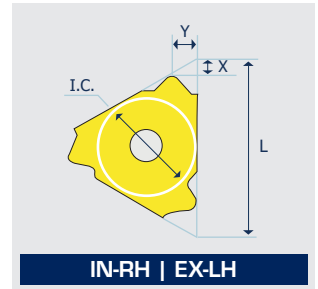
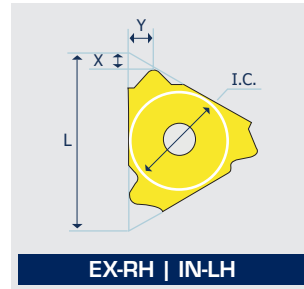
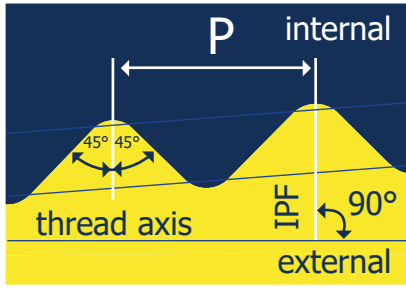
VAM

Pitch TPI	L	I.C. in	Taper IPF	EXTERNAL Ordering Code	X	Y	INTERNAL Ordering Code	X	Y	Connection no. of size
				Right Hand			Right Hand			
8	16	3/8	0.75	16 ER 8 VAM	1.7	1.8	16 IR 8 VAM	1.7	1.8	2 3/8 - 2 7/8
6	22	1/2	0.75	22 ER 6 VAM	2.4	2.4	22 IR 6 VAM	2.5	2.5	3 1/2 - 4 1/2
5	22	1/2	0.75	22 ER 5 VAM	2.4	2.7	22 IR 5 VAM	2.4	2.5	5 - 13 3/8

Order example: 16 ER 8 VAM FXA

For carbide grade and cutting speed see page 78 & 79

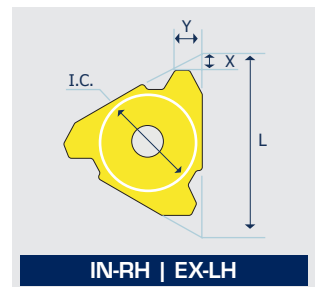
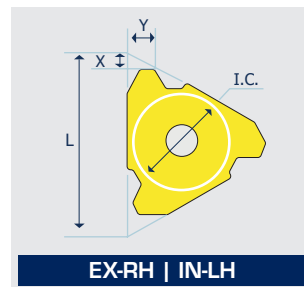
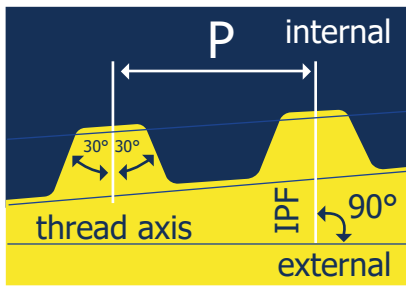
1.1.34 | HUGHES & PAC



HUGHES

Pitch TPI	L	I.C. in	Taper IPF	EXTERNAL	INTERNAL	X	Y	Connection no. of size
				Ordering Code Right Hand	Ordering Code Right Hand			
3.5	27	5/8	2	27 ER 3.5 H-902	27 IR 3.5 H-902	2.8	3.8	3 1/2 - 6 5/8
3.5	27	5/8	3	27 ER 3.5 H-903	27 IR 3.5 H-903	2.8	3.8	7 - 8 5/8
3	27	5/8	1.25	27 ER 3 SLH-90	27 IR 3 SLH-90	3.3	4.6	2 3/8 - 3 1/2

Order example: 27 ER 3.5 H-902 FXA

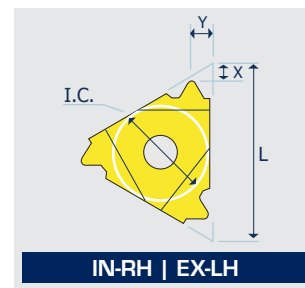
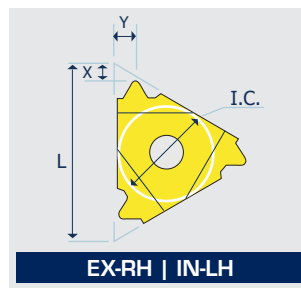
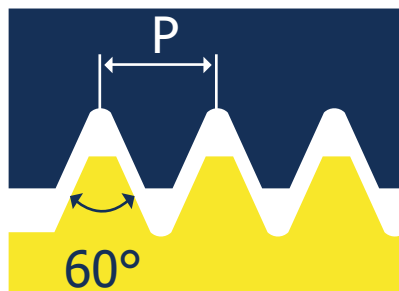


PAC

Pitch TPI	L	I.C. in	Taper IPF	EXTERNAL	INTERNAL	X	Y	Connection no. of size
				Ordering Code Right Hand	Ordering Code Right Hand			
4	22	1/2	1.5	22 ER 4 PAC	22 IR 4 PAC	2.3	2.3	2 1/2 - 2 7/8
4	27	5/8	1.5	27 ER 4 PAC	27 IR 4 PAC	2.3	2.3	2 1/2 - 2 7/8

Order example: 22 ER 4 PAC FXA

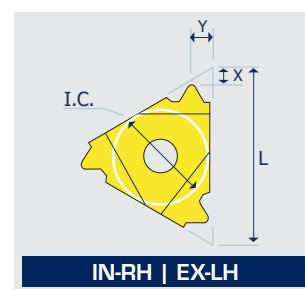
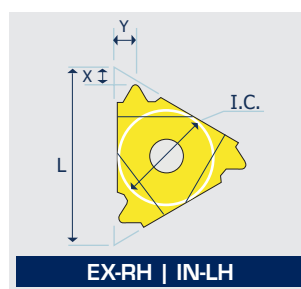
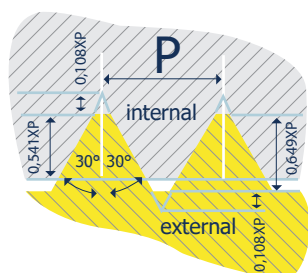
1.1.35 | NPS & NPSM



NPS

Pitch TPI	L	I.C. in	EXTERNAL Ordering Code				INTERNAL Ordering Code				X	Y
			Right Hand		Left Hand		Right Hand		Left Hand			
			18	16	3/8	16 ER 18 NPS	16 EL 18 NPS	16 IR 18 NPS	16 IL 18 NPS	0.8		
14	16	3/8	16 ER 14 NPS	16 EL 14 NPS	16 IR 14 NPS	16 IL 14 NPS	1	1.3				
11.5	16	3/8	16 ER 11.5 NPS	16 EL 11.5 NPS	16 IR 11.5 NPS	16 IL 11.5 NPS	1	1.5				
8	16	3/8	16 ER 8 NPS	16 EL 8 NPS	16 IR 8 NPS	16 IL 8 NPS	1.3	1.8				

Order example: 16 ER 18 NPS FXA



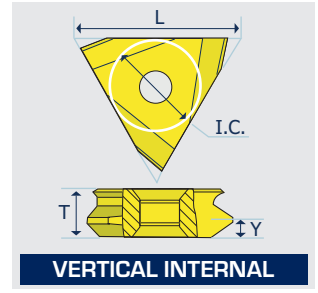
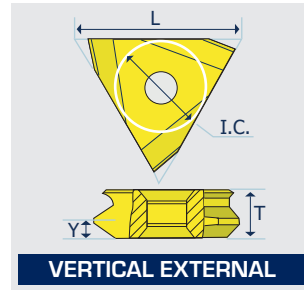
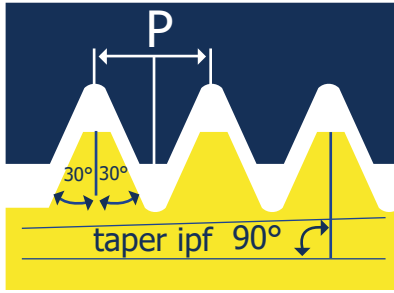
NPSM

Pitch TPI	L	I.C. in	EXTERNAL Ordering Code		X	Y	INTERNAL Ordering Code		X	Y
			Right Hand				Right Hand			
			18	8			3/16			
18	11	1/4					11 IR 18 NPSM	0.8	1.0	
18	16	3/8	16 ER 18 NPSM		0.8	1.0				
14	16	3/8	16 ER 14 NPSM		1.0	1.2	16 IR 14 NPSM	1.0	1.2	
11.5	16	3/8	16 ER 11.5 NPSM		1.2	1.5	16 IR 11.5 NPSM	1.2	1.5	
8	16	3/8	16 ER 8 NPSM		1.3	1.6	16 IR 8 NPSM	1.2	1.5	

Order example: 16 ER 18 NPSM FXA

For carbide grade and cutting speed page 78 & 79

1.1.36 VERTICAL | API



Thread Form	Pitch TPI	L	I.C. in	Taper IPF	EXTERNAL Ordering Code	Y	T	Connection no. of size
V-0.040	5	27	5/8	3	TNMB 54 ER 5 API 403	2.5	6.4	2 3/8-4 1/2 REG
V-0.038R	4	27	5/8	2	TNMC 55 ER 4 API 382	2.8	7.94	NC23-NC50
V-0.038R	4	27	5/8	3	TNMC 55 ER 4 API 383	2.8	7.94	NC56-NC77
V-0.050	4	27	5/8	2	TNMC 55 ER 4 API 502	3.0	7.94	6 5/8 REG
V-0.050	4	27	5/8	3	TNMC 55 ER 4 API 503	3.0	7.94	5 1/2, 7 5/8, 8 5/8 REG

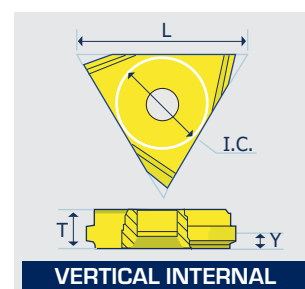
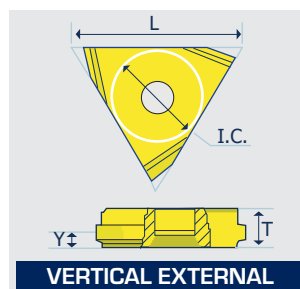
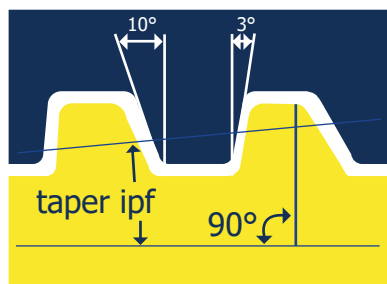
Order example: TNMB 54 ER 5 API 403 FXA

Thread Form	Pitch TPI	L	I.C. in	Taper IPF	INTERNAL Ordering Code	Y	T	Connection no. of size
V-0.040	5	27	5/8	3	TNMB 54 IR 5 API 403	2.5	6.4	2 3/8-4 1/2 REG
V-0.038R	4	27	5/8	2	TNMC 55 IR 4 API 382	2.8	7.94	NC23-NC50
V-0.038R	4	27	5/8	3	TNMC 55 IR 4 API 383	2.8	7.94	NC56-NC77
V-0.050	4	27	5/8	2	TNMC 55 IR 4 API 502	3.0	7.94	6 5/8 REG
V-0.050	4	27	5/8	3	TNMC 55 IR 4 API 503	3.0	7.94	5 1/2, 7 5/8, 8 5/8 REG

Vertical inserts to be used with compatible holders on the market
 Order example: TNMB 54 IR 5 API 403 FXA

For carbide grade and cutting speed see page 78 & 79

1.1.37 VERTICAL | API buttress casing



Pitch TPI	L	I.C. in	Taper IPF	EXTERNAL Ordering Code	Y	T	Connection no. of size
5	27	5/8	0.75	TNMB 54 ER 5 BUT 0.75	2.4	6.4	4 1/2 - 13 3/8
5	27	5/8	1.00	TNMB 54 ER 5 BUT 1.0	2.4	6.4	16 - 20

Order example: TNMB 54 ER 5 BUT 0.75 FXA

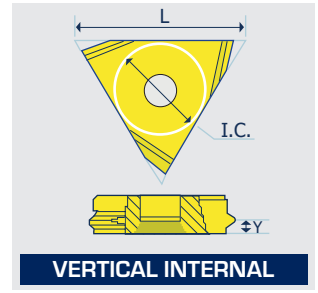
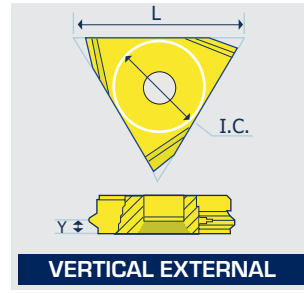
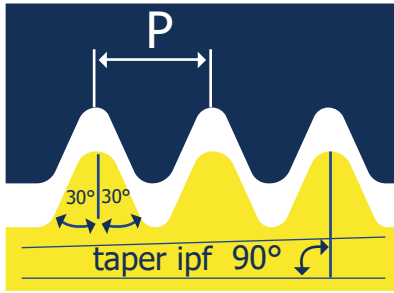
Pitch TPI	L	I.C. in	Taper IPF	INTERNAL Ordering Code	Y	T	Connection no. of size
5	27	5/8	0.75	TNMB 54 IR 5 BUT 0.75	2.4	6.4	4 1/2 - 13 3/8
5	27	5/8	1.00	TNMB 54 IR 5 BUT 1.0	2.4	6.4	16 - 20

Vertical inserts to be used with compatible holders on the market

Order example: TNMB 54 IR 5 BUT 0.75 FXA

For carbide grade and cutting speed see page 78 & 79

1.1.38 VERTICAL | API round



Pitch TPI	L	I.C. in	Taper IPF	EXTERNAL	
				Ordering Code	Y T
10	22	1/2	0.75	TNMB 43 ER 10 API RD	1.45 4.76
8	22	1/2	0.75	TNMB 43 ER 8 API RD	1.65 4.76

Order example: TNMB 43 ER 10 API RD FXA

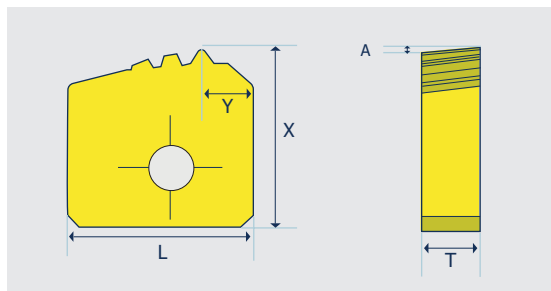
Pitch TPI	L	I.C. in	Taper IPF	INTERNAL	
				Ordering Code	Y T
10	22	1/2	0.75	TNMB 43 IR 10 API RD	1.45 4.76
8	22	1/2	0.75	TNMB 43 IR 8 API RD	1.65 4.76

Vertical Inserts to be used with compatible holders on the market

Order example: TNMB 43 IR 10 API RD FXA

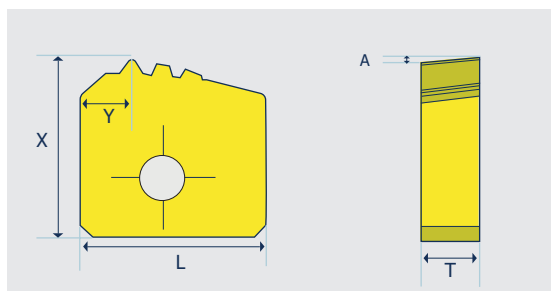
For carbide grade and cutting speed see page 78 & 79

1.1.39 CHASERS | API round



Pitch TPI	L	Taper IPF	EXTERNAL Ordering Code	X	Y	T	A	No. of Teeth
10	15.75	0.75	15.75 ER 10 API RD 3T	15.435	4.4	4.76	6°	3
8	15.75	0.75	15.75 ER 8 API RD 3T	15.84	4.4	4.76	6°	3

Order example: 15.75 ER 10 API RD 3T FXA

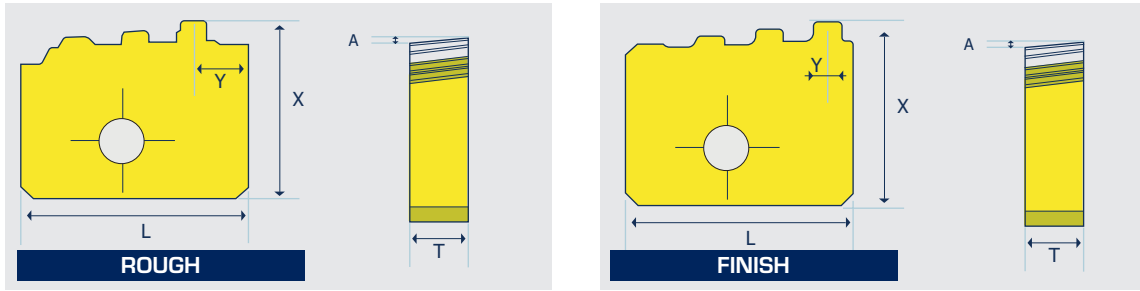


Pitch TPI	L	Taper IPF	INTERNAL Ordering Code	X	Y	T	A	No. of Teeth
10	15.75	0.75	15.75 IR10 API RD 4T	15.75	5.7	4.76	10°	4
8	15.875	0.75	15.875 IR 8 API RD 4T	15.75	4.2	4.76	10°	4

Chasers to be used with compatible holders on the market
Order example: 15.75 IR 10 API RD 4T FXA

For carbide grade see page 80

1.1.40 CHASERS | API buttress casing (Insert size 20)



Pitch TPI	L	Taper IPF	EXTERNAL Ordering Code	X	Y	T	A	No. of Teeth
5	20	0.75	20 ER 5 BUT 0.75R	15.692	4.84	4.76	6°	3
5	20	0.75	20 ER 5 BUT 0.75F	15.875	2.3	4.76	6°	4

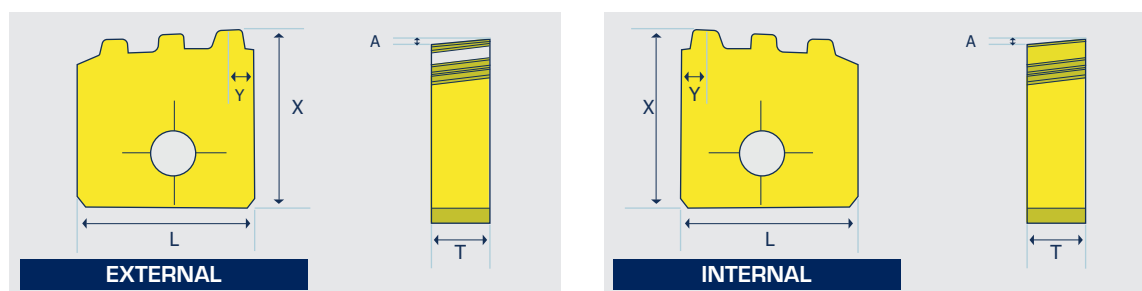
Order example: 20 ER 5 BUT 0.75R FXA

1.1.41 CHASERS | OTTM buttress casing (Insert size 20)

Pitch TPI	L	Taper IPF	EXTERNAL Ordering Code	X	Y	T	A	No. of Teeth
5	20	0.75	20 ER 5 OTTM 0.75R	15.692	4.79	4.76	6°	3
5	20	0.75	20 ER 5 OTTM 0.75F	15.909	2.25	4.76	6°	4

Chasers to be used with compatible holders on the market
Order example: 20 ER 5 OTTM 0.75R FXA

1.1.42 CHASERS | API buttress casing (Insert size 15.75)



Pitch TPI	L	Taper IPF	EXTERNAL Ordering Code	X	Y	T	A	No. of Teeth
5	15.75	0.75	15.75 ER 5 BUT 0.75 3T	15.875	2.3	4.76	10°	3

Pitch TPI	L	Taper IPF	INTERNAL Ordering Code	X	Y	T	A	No. of Teeth
5	15.875	0.75	15.875 IR 5 BUT 0.75 3T	15.75	2.5	4.76	10°	3

Order example: 15.875 IR 5 BUT 0.75 3T FXA

1.1.43 CHASERS | OTTM buttress casing (Insert size 15.75)

Pitch TPI	L	Taper IPF	EXTERNAL Ordering Code	X	Y	T	A	No. of Teeth
5	15.75	0.75	15.75 ER 5 OTTM 0.75 3T	15.75	3.0	4.76	6°	3

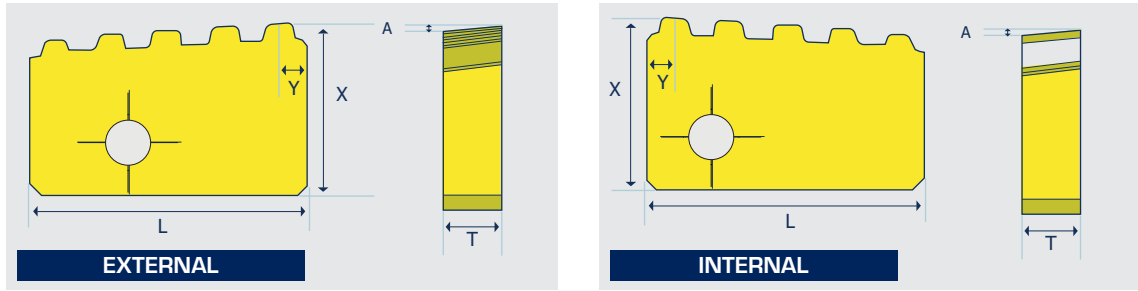
Pitch TPI	L	Taper IPF	INTERNAL Ordering Code	X	Y	T	A	No. of Teeth
5	15.875	0.75	15.875 IR 5 OTTM 0.75 3T	15.875	2.5	4.76	10°	3

Chasers to be used with compatible holders on the market

Order example: 15.875 IR 5 OTTM 0.75 3T FXA

For carbide grade see page 80

1.1.44 CHASERS | API buttress casing (Insert size 25)



Pitch TPI	L	Taper IPF	EXTERNAL Ordering Code	X	Y	T	A	No. of Teeth
5	25	0.75	25 ER 5 BUT 0.75 5T	15.871	2.5	5	10°	5

Pitch TPI	L	Taper IPF	INTERNAL Ordering Code	X	Y	T	A	No. of Teeth
5	25	0.75	25 IR 5 BUT 0.75 5T	15.875	2.5	5	10°	5

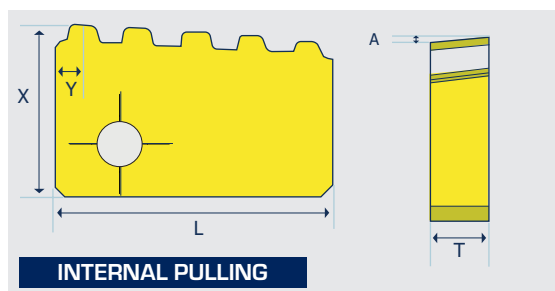
Order example: 25 IR 5 BUT 0.75 5T FXA

1.1.45 CHASERS | OTTM Buttress Casing (Insert Size 25)

Pitch TPI	L	Taper IPF	INTERNAL Ordering Code	X	Y	T	A	No. of Teeth
5	25	0.75	25 IR 5 OTTM 0.75 5T	15.75	2.5	5	10°	5

Chasers to be used with compatible holders on the market.
Order example: 25 IR 5 OTTM 0.75 5T FXA.

1.1.46 CHASERS | API buttress casing (Insert size 25)



Pitch TPI	L	Taper IPF	INTERNAL Ordering Code	X	Y	T	A	No. of Teeth
5	25	0.75	25 IRP 5 BUT 0.75 5T	15.75	2.5	5	10°	5

Order example: 25 IRP 5 BUT 0.75 5T FXA

1.1.47 CHASERS | OTTM buttress casing (Insert size 25)

Pitch TPI	L	Taper IPF	INTERNAL Ordering Code	X	Y	T	A	No. of Teeth
5	25	0.75	25 IRP 5 OTTM 0.75 5T	15.75	2.5	5	10°	5

Chasers to be used with compatible holders on the market

Order example: 25 IRP 5 OTTM 0.75 5T FXA

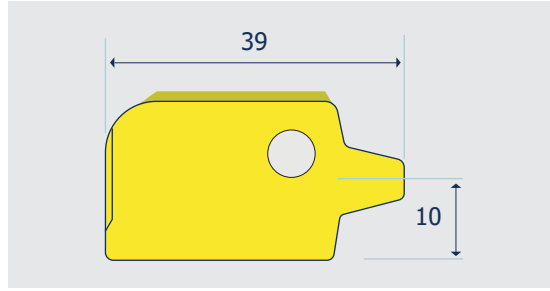
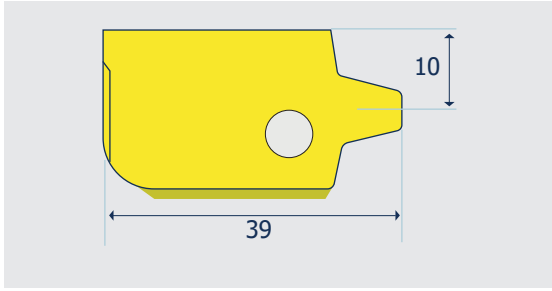
For carbide grade see page 80



1.2 LARGE PROFILE INSERTS AND TOOLHOLDERS

- Wide range of pitches
- Rigid clamping
- Tailor made profiles according to customer's request are possible
- No stock items

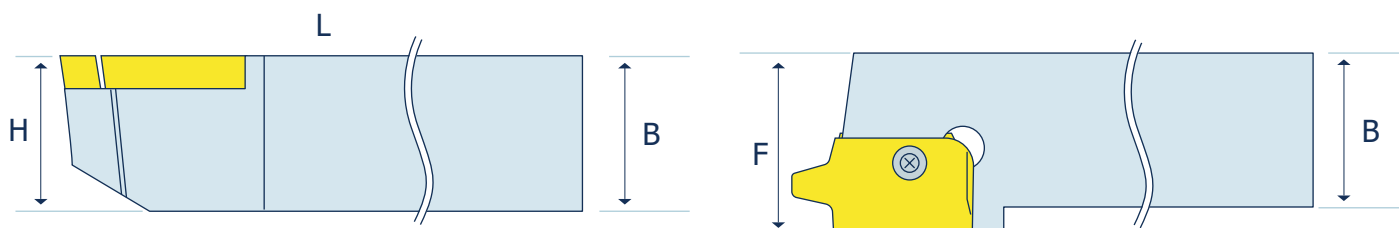
1.2.1 LARGE PROFILE INSERTS | Trapez - DIN 103



Pitch mm	Ordering Code EX RH	Holder Code	Ordering Code EX LH	Holder Code	Ordering Code IN RH	Holder Code	Ordering Code IN LH	Holder Code
14	40 ER 14 TR	H1	40 EL 14 TR	H2	40 IR 14 TR	H7, 6	40 IL 14 TR	H8, 5
16	40 ER 16 TR		40 EL 16 TR		40 IR 16 TR		40 IL 16 TR	
18	40 ER 18 TR		40 EL 18 TR		40 IR 18 TR		40 IL 18 TR	
20	40 ER 20 TR	H3	40 EL 20 TR	H4	40 IR 20 TR	H9	40 IL 20 TR	H10
22	40 ER 22 TR		40 EL 22 TR		40 IR 22 TR		40 IL 22 TR	
24	40 ER 24 TR		40 EL 24 TR		40 IR 24 TR		40 IL 24 TR	

Carbide grade: FXA
Order example: 40 ER 14 TR FXA

1.2.2 EXTERNAL HOLDERS



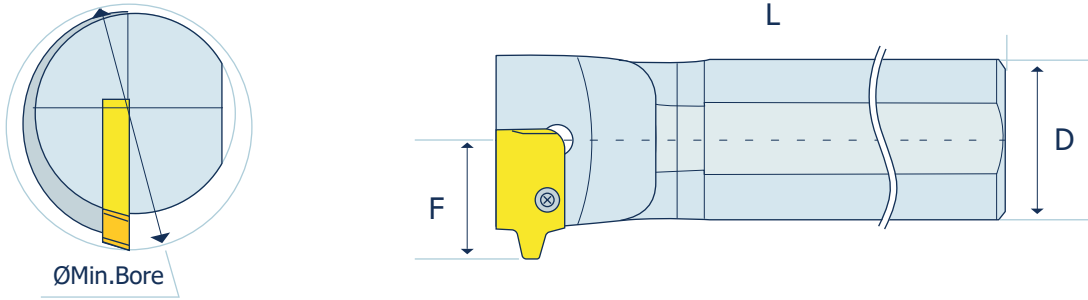
Pitch Range (mm) 14, 16, 18		B=H	L	F	Insert Screw	Torx Screw	Holder No.
Ordering Code							
EX-RH	SER 3232 P40	32	170	32	S40	K40	H1
EX-LH	SEL 3232 P40	32	170	32	S40	K40	H2

Pitch Range (mm) 20, 22, 24		B=H	L	F	Insert Screw	Side Screw	Torx Screw	Holder No.
Ordering Code								
EX-RH	SER 3232 P40T	32	170	32	S40	Y27	K40	H3
EX-LH	SEL 3232 P40T	32	170	32	S40	Y27	K40	H4

Pitch Range (mm) 14, 16, 18		B=H	L	F	Insert Screw	Torx Screw	Holder No.
Ordering Code							
EX-RH	SER 2525 M40	25	150	32	S40	K40	*H5
EX-LH	SEL 2525 M40	25	150	32	S40	K40	*H6

* H5 and H6 toolholders to be used with toolbar provided by the customer

1.2.3 INTERNAL HOLDERS

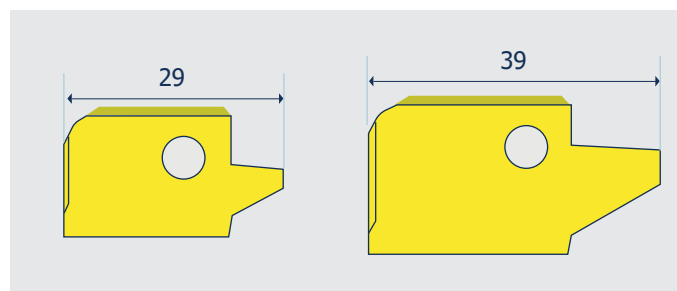
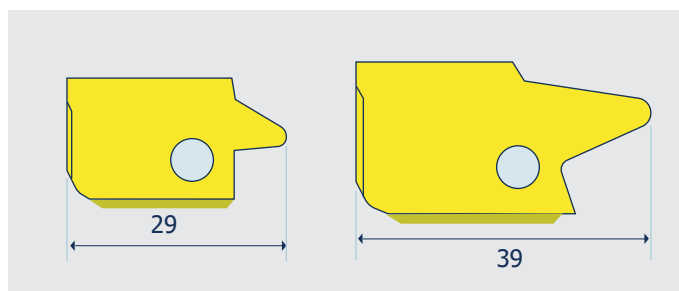


Pitch Range (mm) 14, 16, 18 Ordering Code		D	Min Bore Diam.	L	F	Insert Screw	Torx Screw	Holder No.
IN-RH	SIR 0050 V40	50	70	400	37	S40	K40	H7
IN-LH	SIL 0050 V40	50	70	400	37	S40	K40	H8

Pitch Range (mm) 20, 22, 24 Ordering Code		D	Min Bore Diam.	L	F	Insert Screw	Side Screw	Torx Screw	Holder No.
IN-RH	SIR 0050 V40T	50	70	400	37	S40	Y27	K40	H9
IN-LH	SIL 0050 V40T	50	70	400	37	S40	Y27	K40	H10

* H5 and H6 toolholders to be used with toolbar provided by the customer

1.2.4 LARGE PROFILE SAGENGEWINDE INSERTS | DIN 513



Pitch mm	Ordering Code EX RH	Holder Code
9	30 ER 9 SAGE	S1, 2
10	40 ER 10 SAGE	S3, 4
12	40 ER 12 SAGE	S3, 4
14	40 ER 14 SAGE	S5
16	40 ER 16 SAGE	S6

Ordering Code IN RH	Holder Code
30 IR 9 SAGE	S7
40 IR 10 SAGE	S8
40 IR 12 SAGE	S9
40 IR 14 SAGE	S10
40 IR 16 SAGE	S11

Carbide grade: FXA

Order example: 30 ER 9 SAGE FXA

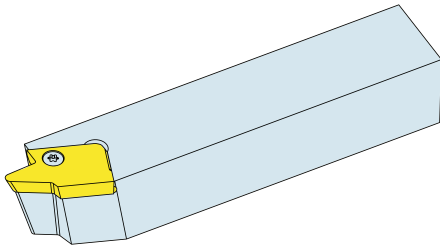
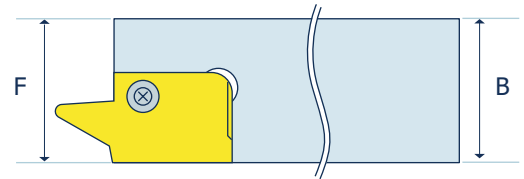
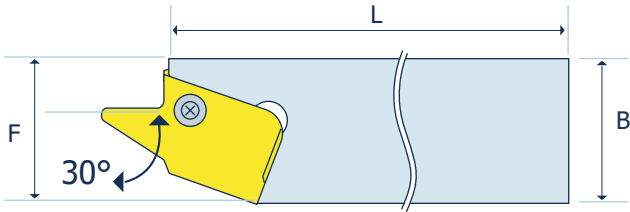
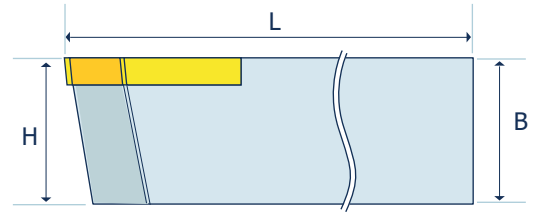
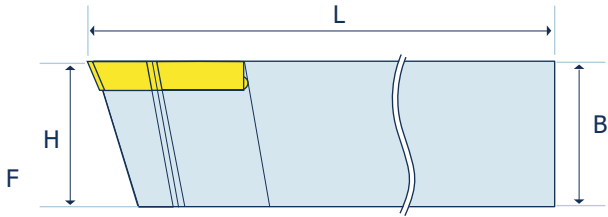
Additional profiles upon request

Round (DIN 20400)

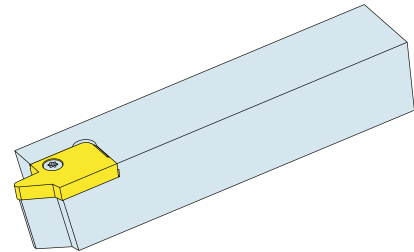
Acme, Stub Acme

American Buttress

1.2.5 EXTERNAL HOLDERS



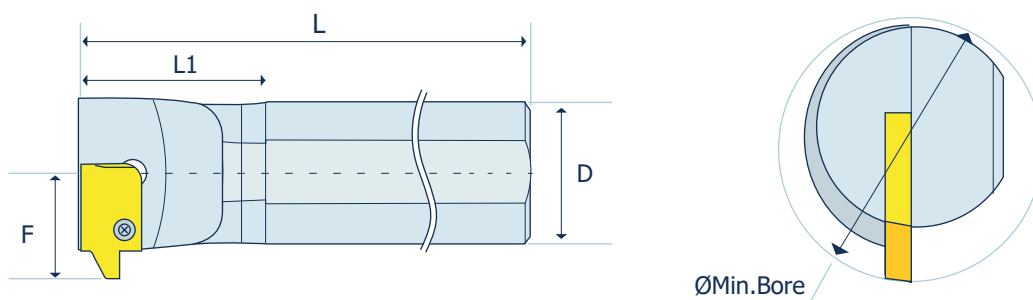
Version A



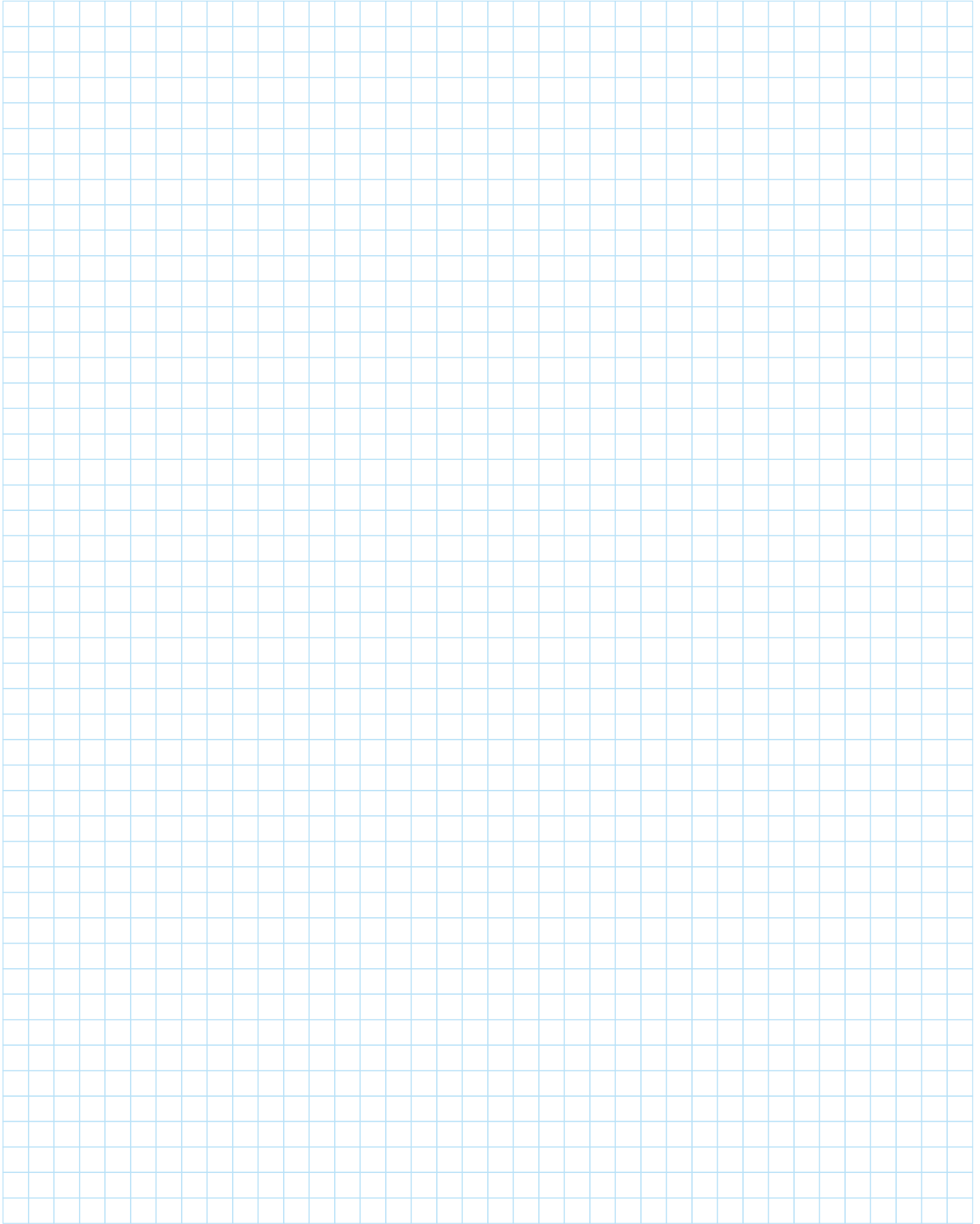
Version B

Ordering Code EX-RH	B=H	L	F	Insert Screw	Torx Screw	Version	Holder No.
SER 2525 M30	25	150	25	S30	K30	B	S1
SER 3232 P30	32	170	32	S30	K30	B	S2
SER 2525 M40T	25	150	25	S40	K40	B	S3
SER 3232 P40S	32	170	32	S40	K40	B	S4
SER 3232 P40W	32	170	32	S40	K40	B	S5
SER 3232 P40Q	32	170	32	S40	K40	A	S6

1.2.6 INTERNAL HOLDERS

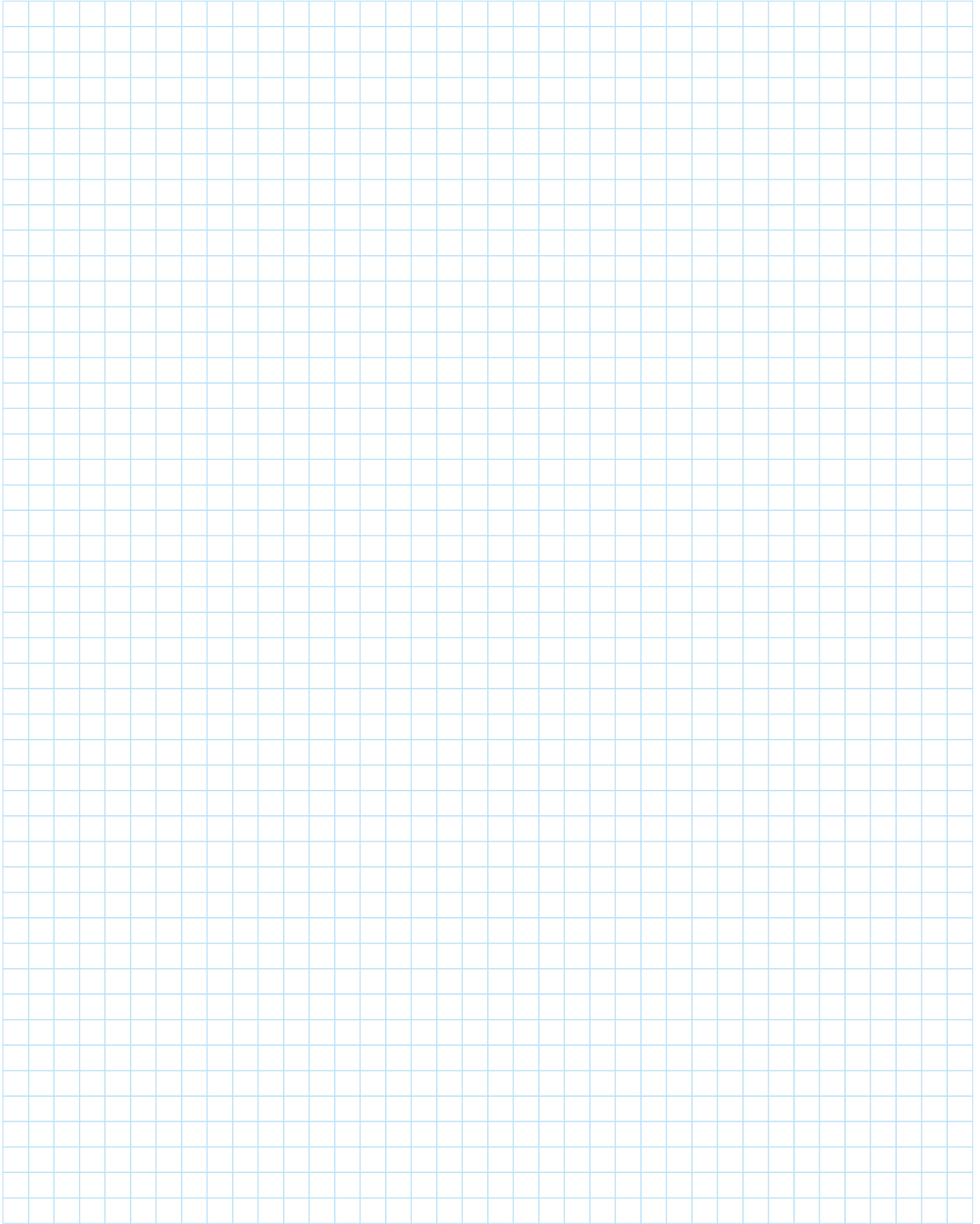


Ordering Code IN-RH	D	Min Bore Diam.	L	L1	F	Insert Screw	Torx Screw	Holder No.
SIR 0032 S30	32	40.0	250	120	24.0	S30	K30	S7
SIR 0040 T40	40	49.0	300	140	28.0	S40	K40	S8
SIR 0050 U40	50	65.0	350	-	35.0	S40	K40	S9
SIR 0060 V40	60	80.0	400	-	41.0	S40	K40	S10
SIR 0060 V40T	60	80.0	400	-	43.0	S40	K40	S11





1.3 THREAD TURNING TOOLHOLDERS



1.3.1 THREADING TOOLHOLDERS | Ordering codes

S



Clamping method
D = Clamp
S = Screw

E



E External
I Internal

R

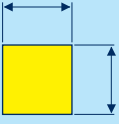


R Right Hand
L Left Hand

2020




Shank Cross Section:
External toolholders
 square shank



2020 = 20 mm x 20 mm

Internal Toolholders
 & boring bars
 round shank



0020 = diam. of 20 mm

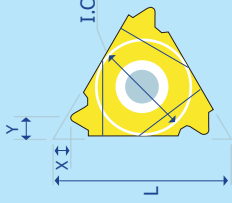
K



Length of toolholder

D = 60
F = 80
H = 100
K = 125
L = 140
M = 150
P = 170
R = 200
S = 250
T = 300
U = 350
V = 400

16

L I.C.

06	5/32"
08	3/16"
08U	3/16"U
11	1/4"
16	3/8"
16V	3/8"V
22	1/2"
22V	1/2"V
22U	1/2"U
27	5/8"V
27V	5/8"V
27U	5/8"U
33U	3/4"

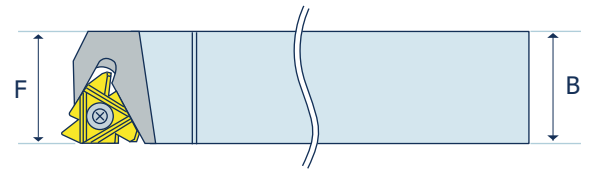
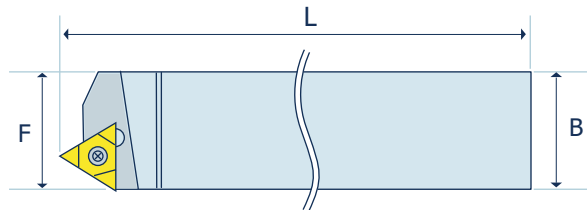
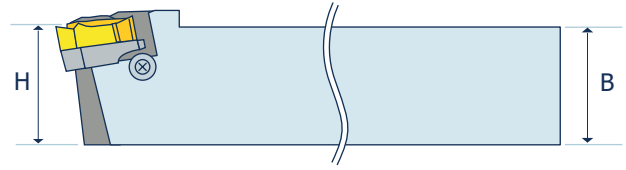
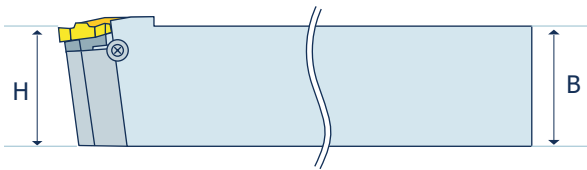
B



- B** - With coolant bore
- CB** - Carbide shank
- V** - Vertical (on edge)
- O** - Offset style
- D** - Drop head
- G** - Gang tool
- U** - U-TYPE

1.3.2 EXTERNAL TOOLHOLDERS

U-TYPE



Ordering Code Right Hand	L	B=H	L	F	Insert Screw	Anvil Screw	Torx Key	RH Anvi	LH Anvil
*SER 8 8 H11	11	8	100	11	S11	-	K11	-	-
*SER 1010 H11	11	10	100	11	S11	-	K11	-	-
*SER 1010 M11	11	10	150	11	S11	-	K11	-	-
*SER 1212 K11	11	12	125	12	S11	-	K11	-	-
*SER 1212 M11	11	12	150	12	S11	-	K11	-	-
SER 1212 F16	16	12	80	16	S16	Y16	K16	YE16	YE16
SER 1616 H16	16	16	100	16	S16	Y16	K16	YE16	YE16
SER 2020 K16	16	20	125	20	S16	Y16	K16	YE16	YE16
SER 2525 M16	16	25	150	25	S16	Y16	K16	YE16	YE16
SER 3232 P16	16	32	170	32	S16	Y16	K16	YE16	YE16
SER 2525 M22	22	25	150	25	S22	Y22	K22	YE22	YE22
SER 3232 P22	22	32	170	32	S22	Y22	K22	YE22	YE22
SER 4040 R22	22	40	200	40	S22	Y22	K22	YE22	YE22
SER 2525 M22U	22U	25	150	28	S22	Y22	K22	YE22U	YE22U
SER 3232 P22U	22U	32	170	32	S22	Y22	K22	YE22U	YE22U
SER 4040 R22U	22U	40	200	40	S22	Y22	K22	YE22U	YE22U
SER 2525 M27	27	25	150	32	S27	Y27	K27	YE27	YE27
SER 3232 P27	27	32	170	32	S27	Y27	K27	YE27	YE27
SER 4040 R27	27	40	200	40	S27	Y27	K27	YE27	YE27
SER 2525 M27U	27U	25	150	32	S27	Y27	K27	YE27U	YE27U
SER 3232 P27U	27U	32	170	32	S27	Y27	K27	YE27U	YE27U
SER 4040 R27U	27U	40	200	40	S27	Y27	K27	YE27U	YE27U
*SER 2525 M33U	33U	25	150	32	S33	-	K33	-	-
*SER 3232 P33U	33U	32	170	32	S33	-	K33	-	-

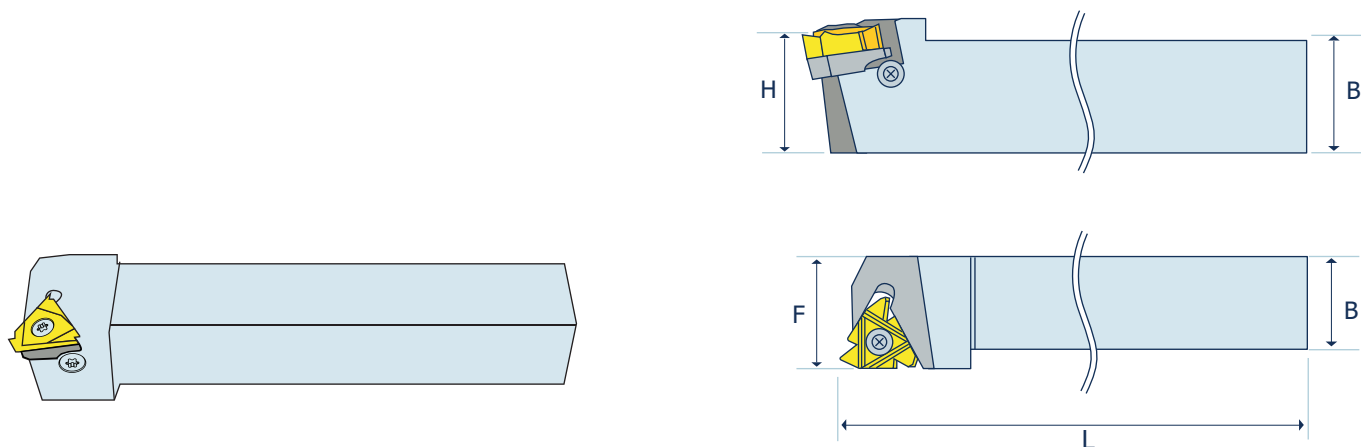
* Toolholders with no anvil


For **LEFT HAND** toolholders specify **SEL** instead of **SER**

Toolholders are made with a **1.5° Helix Angle**.

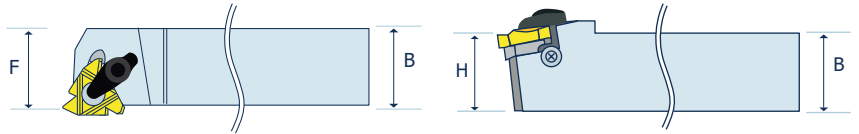
For other Helix Angles please see helix angle chart (page 81) in the technical section of this catalog

1.3.3 OFF-SET TOOLHOLDERS



Ordering Code Right Hand	L 	B=H	L	F	Insert Screw	Anvil Screw	Torx Key	RH Anvi	LH Anvil
SER 1212 F16-O	16	12	8	16	S16	Y16	K16	YE16	YI16
SER 1616 H16-O	16	16	100	20	S16	Y16	K16	YE16	YI16
SER 2020 K16-O	16	20	125	25	S16	Y16	K16	YE16	YI16
SER 2525 M16-O	16	25	150	32	S16	Y16	K16	YE16	YI16
SER 3232 P16-O	16	32	170	40	S16	Y16	K16	YE16	YI16
SER 2525 M22-O	22	25	150	32	S22	Y22	K22	YE22	YI22
SER 3232 P22-O	22	32	170	40	S22	Y22	K22	YE22	YI22

1.3.4 EXTERNAL TOOLHOLDERS WITH TOP CLAMP

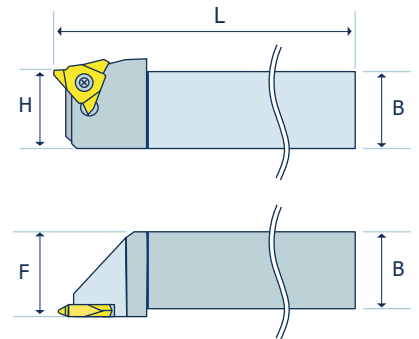


Ordering Code Right Hand	L	B=H	L	F	Insert Screw	Clamp	Anvil Screw	Torx Key	RH Anvi	LH Anvil
DER 1212 H16	16	12	100	16	S16	C16	Y16S	K16	YE16	YI16
DER 1616 H16	16	16	100	16	S16	C16	Y16S	K16	YE16	YI16
DER 2020 K16	16	20	125	20	S16	C16	Y16S	K16	YE16	YI16
DER 2525 M16	16	25	150	25	S16	C16	Y16S	K16	YE16	YI16
*DER 2525 M22	22	25	150	25	S22	C22	Y22	K22	YE22	YI22

For **LEFT HAND** toolholders specify **DEL** instead of **DER**
 Toolholders are made with a **1.5° Helix Angle**. For other Helix Angles please see helix angle chart in the technical section of this catalog.

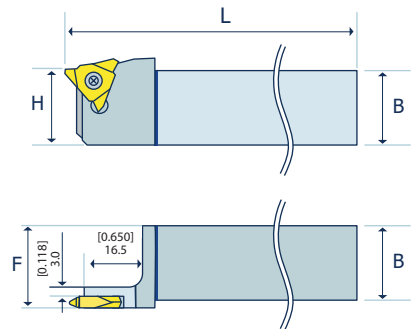
Two clamping methods can be used: screw or top clamp.

* Use K21 torx key for C22 clamp



1.3.5 VERTICAL TOOLHOLDERS

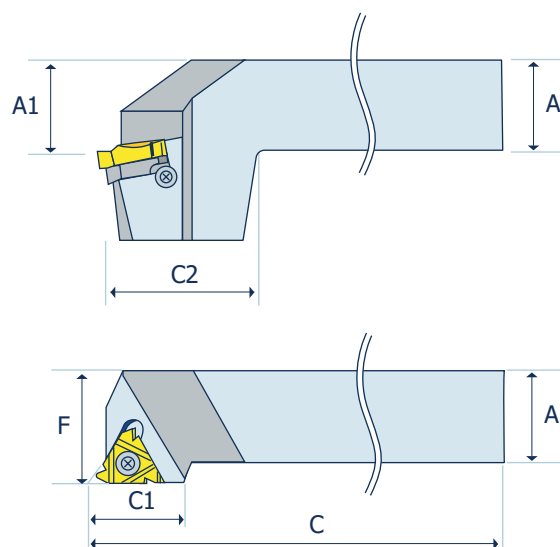
Ordering Code Right Hand	L	B=H	L	F	Insert Screw	Torx Key
SER 1616 H16V	16	16	100	18	S16S	K16
SER 2020 K16V	16	20	125	22	S16S	K16
SER 2525 M16V	16	25	150	27	S16S	K16
SER 2525 M22V	22	25	150	27.5	S22S	K22
SER 3232 P27V-T10	27	32	170	36	S27	K27



1.3.6 SLIM VERTICAL TOOLHOLDERS

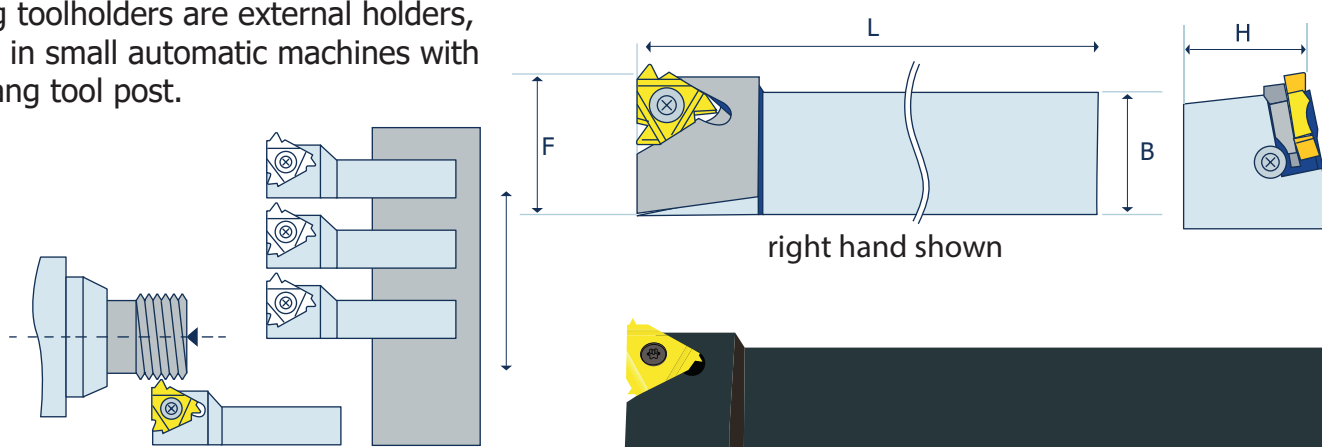
Ordering Code Right Hand	L	B=H	L	F	Insert Screw	Torx Key
SER 1616 H16VS	16	16	100	18	S16S	K16
SER 2020 K16VS	16	20	125	22	S16S	K16
SER 2525 M16VS	16	25	150	27	S16S	K16
SER 2525 M22VS	22	25	150	27	S22S	K22

1.3.7 DROPHEAD TOOLHOLDERS



Ordering Code Right Hand	L	A	A1	C	C1	F	C2	Insert Screw	Anvil Screw	Torx Key	RH Anvi	LH Anvil
SER 2020 K 16D	16	20	20	125	21.0	25	38	S16	Y16	K16	YE16	YI16
SER 2525 M16D	16	25	25	150	21.0	32	38	S16	Y16	K16	YE16	YI16
SER 2525 M22D	22	25	25	150	21.0	32	38	S22	Y22	K22	YE22	YI22

Gang toolholders are external holders, used in small automatic machines with a gang tool post.



1.3.8 GANG TOOLHOLDERS

Ordering Code Right Hand	L	B=H	L	F	Insert Screw	Anvil Screw	Torx Key	RH Anvi	LH Anvil
*SER 8 8 H11G	11	8	100	12.0	S11	-	K11	-	-
*SER 1010 H11G	11	10	100	14.0	S11	-	K11	-	-
SER 1616 K16G	16	16	125	21.7	S16	Y16	K16	YE16	YI16
SER 2020 K16G	16	20	125	26.2	S16	Y16	K16	YE16	YI16

* Toolholders with no anvil
For **LEFT HAND** toolholders specify **SEL** instead of **SER**

1.3.9 JET STREAM | EXTERNAL TOOLHOLDER WITH INTERNAL COOLANT

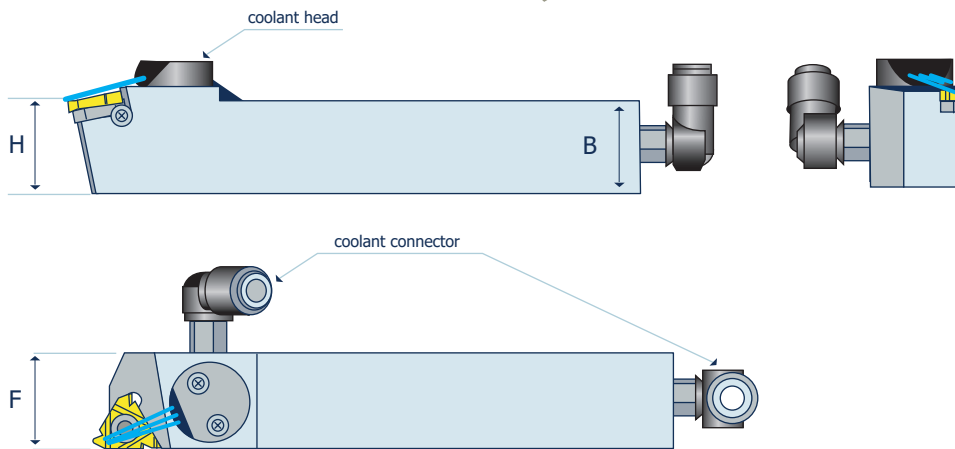
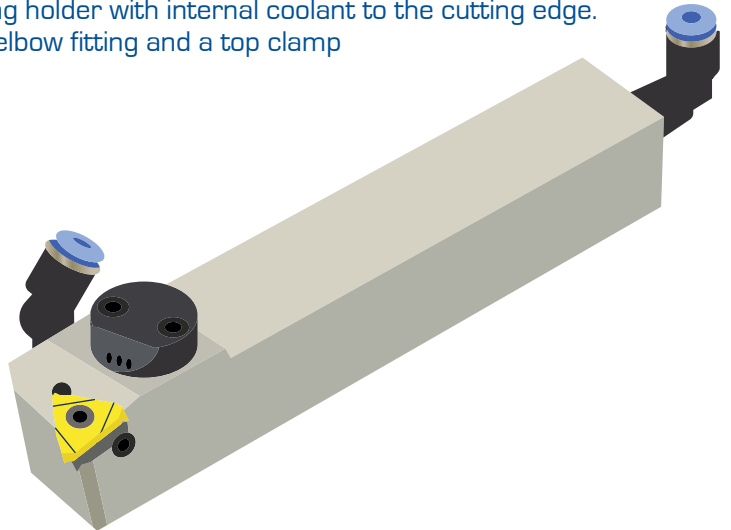
JET STREAM

EXTERNAL TOOLHOLDER WITH INTERNAL COOLANT

Combidex has developed a unique external thread turning holder with internal coolant to the cutting edge. The holder includes two connecting options through an elbow fitting and a top clamp directing the coolant flow to the cutting edge.

The coolant flow provides:

- Better chip control and chip flow
- Longer tool life and high performance
- Reduces the cutting edge temperature
- Available RH and LH toolholders
- Coated holders provide abrasive resistance



Ordering Code	L mm	B=H	L	F	Insert Screw Torx +	Anvil Screw Torx +	Key Torx +	RH Anvil	LH Anvil	Coolant head	Coolant* Connector mm
SER 1616 H16B	16	16	100	16	S16P	Y16P	K16P	YE16	YI16	CH3	Ø4/Ø6
SER 2020 K16B	16	20	125	20	S16P	Y16P	K16P	YE16	YI16	CH1	Ø4/Ø6
SER 2525 M16B	16	25	150	25	S16P	Y16P	K16P	YE16	YI16	CH1	Ø4/Ø6
SER 2525 M22B	22	25	150	25	S22P	Y22P	K22P	YE22	YI22	CH1	Ø4/Ø6
SER 2525 M27B	27	25	150	32	S27P	Y27P	K27P	YE27	YI27	CH1	Ø4/Ø6
SER 3232 P16B	16	32	170	32	S16P	Y16P	K16P	YE16	YI16	CH1	Ø4/Ø6
SER 3232 P22B	22	32	170	32	S22P	Y22P	K22P	YE22	YI22	CH1	Ø4/Ø6
SER 3232 P27B	27	32	170	32	S27P	Y27P	K27P	YE27	YI27	CH1	Ø4/Ø6

For **LEFT HAND** toolholders specify **SEL** instead of **SER**

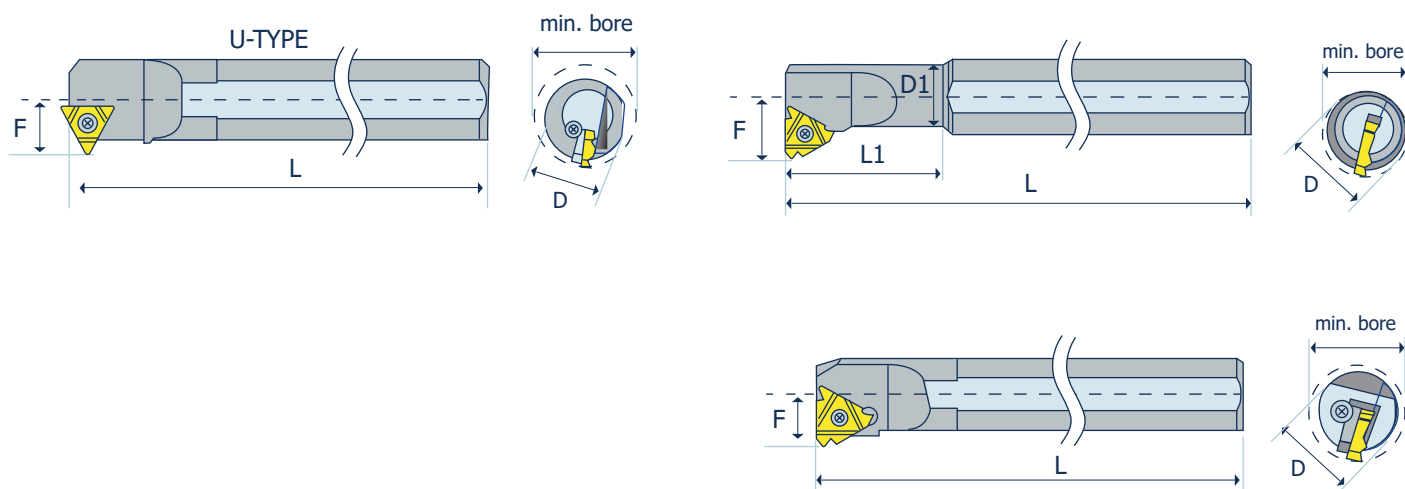
Toolholders made with **1.5° helix angle**

Please consult the helix angle chart page 81 in the technical section of this catalog

* Standard packing with Ø6 mm

[Product on request]

1.3.10 INTERNAL TOOLHOLDERS



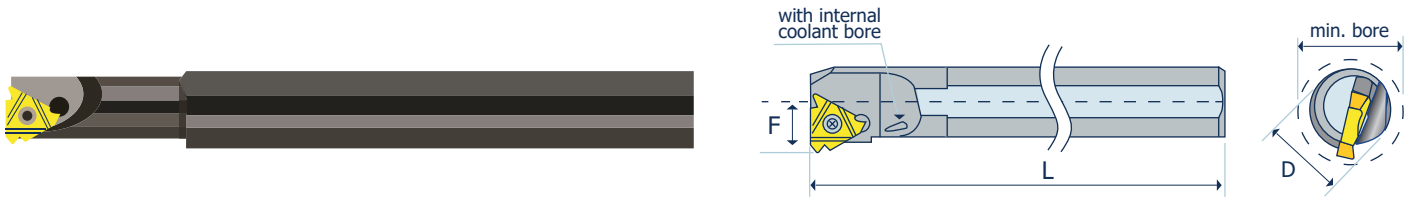
Ordering Code Right Hand	L	D	D1	Min Bore Diam.	L	L1	F	Insert Screw	Anvil Screw	Torx Key	RH Anvil	LH Anvil
*SIR0005 H06	6	12	5.1	6.0	100	12	4.3	S06	-	K06	-	-
*SIR 0007 K08	8	16	6.6	7.8	125	18	5.3	S08	-	K08	-	-
*SIR 0008 K08U	8U	16	7.3	9.0	125	21	6.6	S08	-	K08	-	-
*SIR 0010 H11	11	10	10	12	100	-	7.4	S11	-	K11	-	-
*SIR 0010 K11	11	16	10	12	125	25	7.4	S11	-	K11	-	-
*SIR 0013 L11	11	16	13	15	140	32	8.9	S11	-	K11	-	-
*SIR 0013 M16	16	16	13	16	150	32	10.2	S16S	-	K16	-	-
*SIR 0016 P16	16	20	16	19	170	40	11.7	S16S	-	K16	-	-
SIR 0020 P16	16	20	20	24	170	-	13.7	S16	Y16	K16	YI16	YE16
SIR 0025 R16	16	25	25	29	200	-	16.2	S16	Y16	K16	YI16	YE16
SIR 0032 S16	16	32	32	36	250	-	19.7	S16	Y16	K16	YI16	YE16
SIR 0040 T16	16	40	40	44	300	-	23.7	S16	Y16	K16	YI16	YE16
SIR 0050 U16	16	50	50	54	350	-	28.7	S16	Y16	K16	YI16	YE16
*SIR 0020 P22	22	20	20	24	170	-	15.6	S22S	Y22	K22	YI16	YE16
SIR 0025 R22	22	25	25	29	200	-	18.1	S22	Y22	K22	YI22	YE22
SIR 0032 S22	22	32	32	38	250	-	21.6	S22	Y22	K22	YI22	YE22
SIR 0040 T22	22	40	40	46	300	-	25.6	S22	Y22	K22	YI22	YE22
SIR 0050 U22	22	50	50	56	350	-	30.6	S22	Y22	K22	YI22	YE22
SIR 0032 S22U	22U	32	32	38	250	-	24.4	S22	Y22	K22	YI22U	YE22U
SIR 0040 T22U	22U	40	40	46	300	-	28.1	S22	Y22	K22	YI22U	YE22U
SIR 0050 U22U	22U	50	50	57	350	-	30.8	S22	Y22	K22	YI22U	YE22U
SIR 0032 S27	27	32	32	40	250	-	22.6	S27	Y27	K27	YI27	YE27
SIR 0040 T27	27	40	40	48	300	-	26.6	S27	Y27	K27	YI27	YE27
SIR 0050 U27	27	50	50	58	350	-	31.6	S27	Y27	K27	YI27	YE27
SIR 0060 V27	27	60	60	68	400	-	36.6	S27	Y27	K27	YI27	YE27
SIR 0032 S27U	27U	32	32	40	250	-	25.8	S27	Y27	K27	YI27U	YE27U
SIR 0040 T27U	27U	40	40	48	300	-	29.4	S27	Y27	K27	YI27U	YE27U
SIR 0050 U27U	27U	50	50	58	350	-	34.4	S27	Y27	K27	YI27U	YE27U
SIR 0060 V27U	27U	60	60	68	400	-	39.7	S27	Y27	K27	YI27U	YE27U
*SIR 0050 U33U	33U	50	50	62	350	-	37.5	S33	-	K33	-	-

* Toolholders with no anvil

For **LEFT HAND** toolholders specify **SIL** instead of **SIR**

Toolholders are made with a **1.5° Helix Angle**. For other Helix Angles please see helix angle chart (page 81) in the technical section of this catalog.

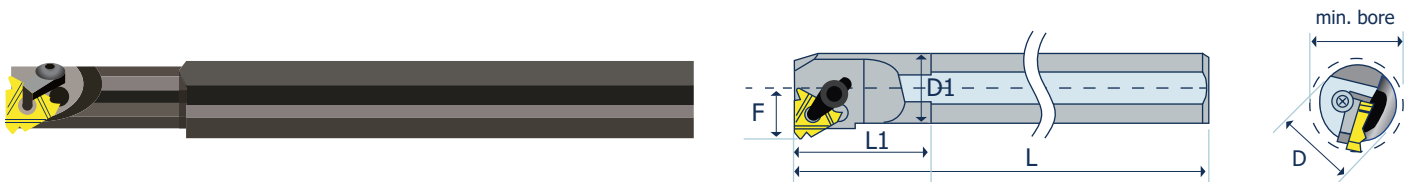
1.3.11 INTERNAL TOOLHOLDER WITH COOLANT BORE



Ordering Code Right Hand	L	D	D1	Min Bore Diam.	L	L1	F	Insert Screw	Anvil Screw	Torx Key	RH Anvil	LH Anvil
*SIR 0010 K11B	11	16	10	12	125	25	7.4	S11	-	K11	-	-
*SIR 0013 M16B	16	16	13	16	150	32	10.2	S16S	-	K16	-	-
*SIR 0016 P16B	16	20	16	19	170	40	11.7	S16S	-	K16	-	-
SIR 0020 P16B	16	20	20	24	170	-	13.7	S16	Y16	K16	YI16	YE16
SIR 0025 R16B	16	25	25	29	200	-	16.2	S16	Y16	K16	YI16	YE16
SIR 0025 R22B	22	25	25	29	200	-	18.1	S22	Y22	K22	YI22	YE22
SIR 0032 S16B	16	32	32	36	250	-	19.7	S16	Y16	K16	YI16	YE16

* Toolholders with no anvil
 For **LEFT HAND** toolholders specify **SIL** instead of **SIR**
 Toolholders are made with a **1.5° Helix Angle**. For other Helix Angles please see helix angle chart (page 81) in the technical section of this catalog.

1.3.12 INTERNAL TOOLHOLDER WITH TOP CLAMP



Ordering Code Right Hand	L	D	D1	Min Bore Diam.	L	L1	F	Insert Screw	Clamp	Anvil Screw	Torx Key	RH Anvil	LH Anvil
DIR 0020 P16	16	20	20	24	170	-	13.7	S16	C16	Y16S	K16	YI16	YE16
DIR 0025 R16	16	25	25	29	200	-	16.2	S16	C16	Y16S	K16	YI16	YE16
DIR 0032 S16	16	32	32	36	250	-	19.7	S16	C16	Y16S	K16	YI16	YE16
* DIR 0025 R22	22	25	25	29	200	-	18.1	S22	C22	Y22	K22	YI22	YE22

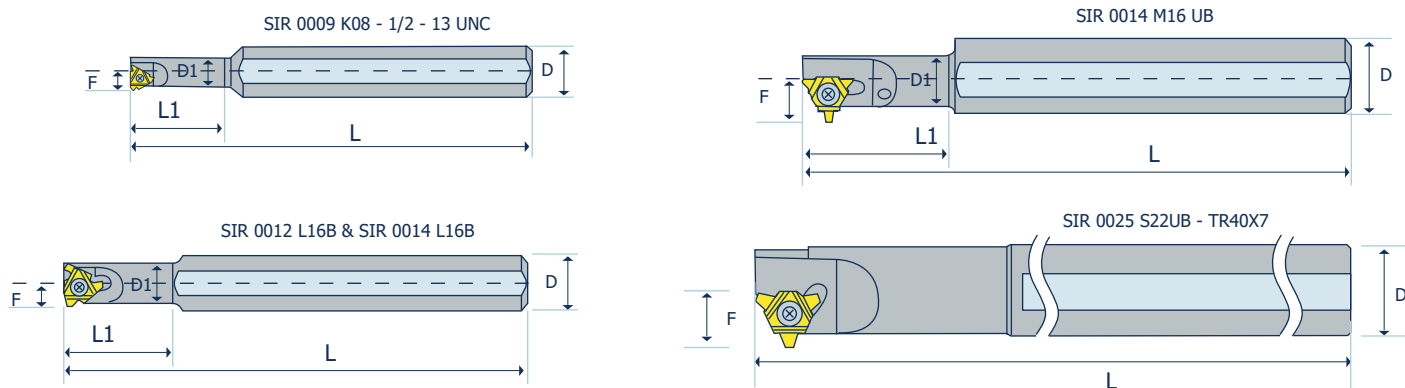
For **LEFT HAND** toolholders specify **DIL** instead of **DIR** Two clamping methods can be used: screw or top clamp. *
 Use K22 torx key for C22 clamp

1.3.13 TOOLHOLDERS WITH 3.5 ° HELIX ANGLE

Ordering Code Right Hand	L	D	D1	Min Bore Diam.	L	L1	F	Insert Screw	Torx Key
SIR 0016 P16B-3.5	16	20	16	19	170	40	13.7	S16S	K16
SIR 0020 P22B-3.5	22	20	20	24	170	-	15.6	S22S	K22

For **LEFT HAND** toolholders specify **SIL** instead of **SIR**

1.3.14 SPECIAL THREAD TURNING APPLICATIONS



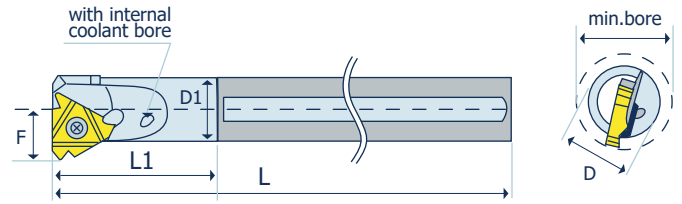
Ordering Code Right Hand	L	D	D1	L	L1	F	Thread	Insert Screw	Torx Key
*SIR 0009 K08	8	16	8.7	125	30	6.5	1/2 - 13UNC	S08	K08
SIR 0012 L16B	16	20	11.5	140	33	10.5	TR18x4	S16S	K16
SIR 0014 L16B	16	20	12.5	140	36	21.1	TR20x4	S16S	K16
SIR 0014 M16UB	16	20	13.5	150	40	13.2	TR22x5	S16S	K16
SIR 0025 S22UB	22	25	-	250		19.5	TR40x7	S22S	K22

For LH holders call Combindex
 * only available in right hand

1.3.15 CARBIDE SHANK THREADING BARS | With coolant bore



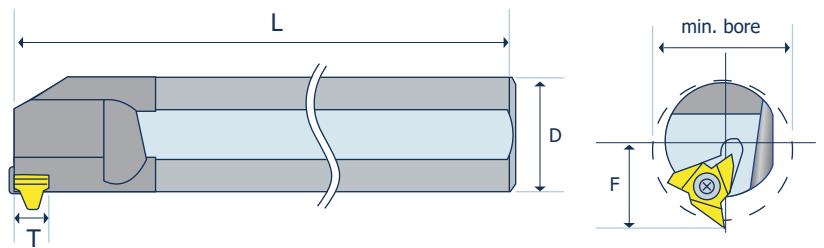
Carbide Shank Threading Bars are used when chatter and deflection are expected due to long overhang in deep small bores.



Ordering Code Right Hand	L	D	D1	Min Bore Diam.	L	L1	F	Insert Screw	Anvil Screw	Torx Key	RH Anvil	LH Anvil
SIR 0005 H06CB	6	6	5.1	6.0	100	26	4.3	S06	-	K06	-	-
SIR 0007 K08CB	8	8	6.6	7.8	125	31	5.3	S08	-	K08	-	-
SIR 0008 K08UCB	8U	8	7.3	9.0	125	35	6.6	S08	-	K08	-	-
SIR 0010 M11CB	11	10	10	12	150	-	7.4	S11	-	K11	-	-
SIR 0012 P11CB	11	12	12	15	170	-	8.4	S11	-	K11	-	-
SIR 0016 R16CB	16	16	16	19	200	-	11.7	S16S	-	K16	-	-
*SIR 0020 S16CB	16	20	20	24	250	-	13.7	S16	Y16	K16	YI16	YE16
*SIR 0025 S16CB	16	25	25	29	250	-	16.2	S16	Y16	K16	YI16	YE16
**SIR 0020 S22CB	22	20	19.3	24	250	100	15.6	S22	-	K22	-	-

- * Carbide shank Threading bars with anvil
- ** Helix angle: 3.5°
For **LEFT HAND** toolholders specify SIL instead of SIR

1.3.16 VERTICAL TOOLHOLDERS



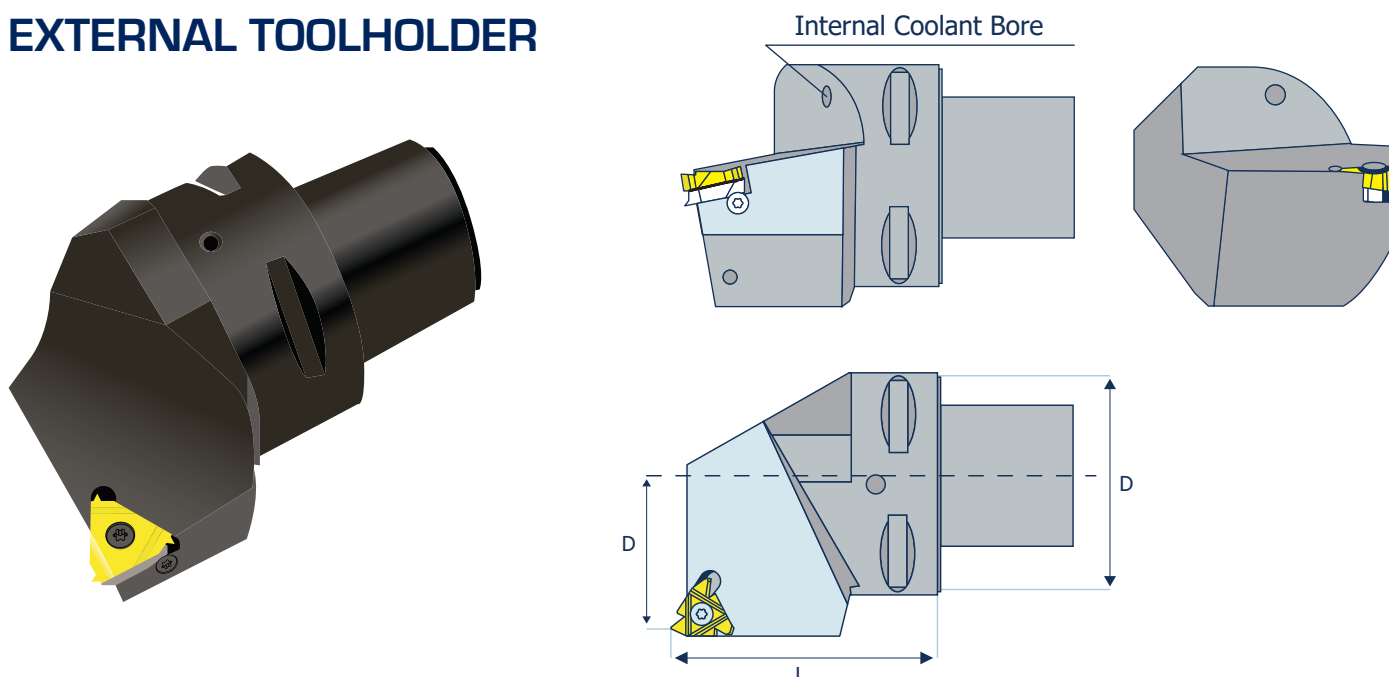
Ordering Code Right Hand	L	D	* Min Bore Diam.	L	F	Insert Screw	Torx Key
SIR 0040T27V-T10	27	40	48	300	29	S27	K27
SIR 0050U27V-T10	27	50	58	350	34	S27	K27

- * To be compared with given minimum bore profile.
For **LEFT HAND** toolholders specify SIL instead of SIR

1.3.17 QC HOLDERS & POLYGON THREADING TOOLHOLDERS

- Polygon shank
- ISO standard (26623) compliant for toolholding systems
- Polygon taper ensures automatic radial centering and even pressure around the coupling
- Enable quick tool changes ISO standard coupling system with a 1.4 degree tapered polygon shank design
- Interchangeable with leading manufacturers

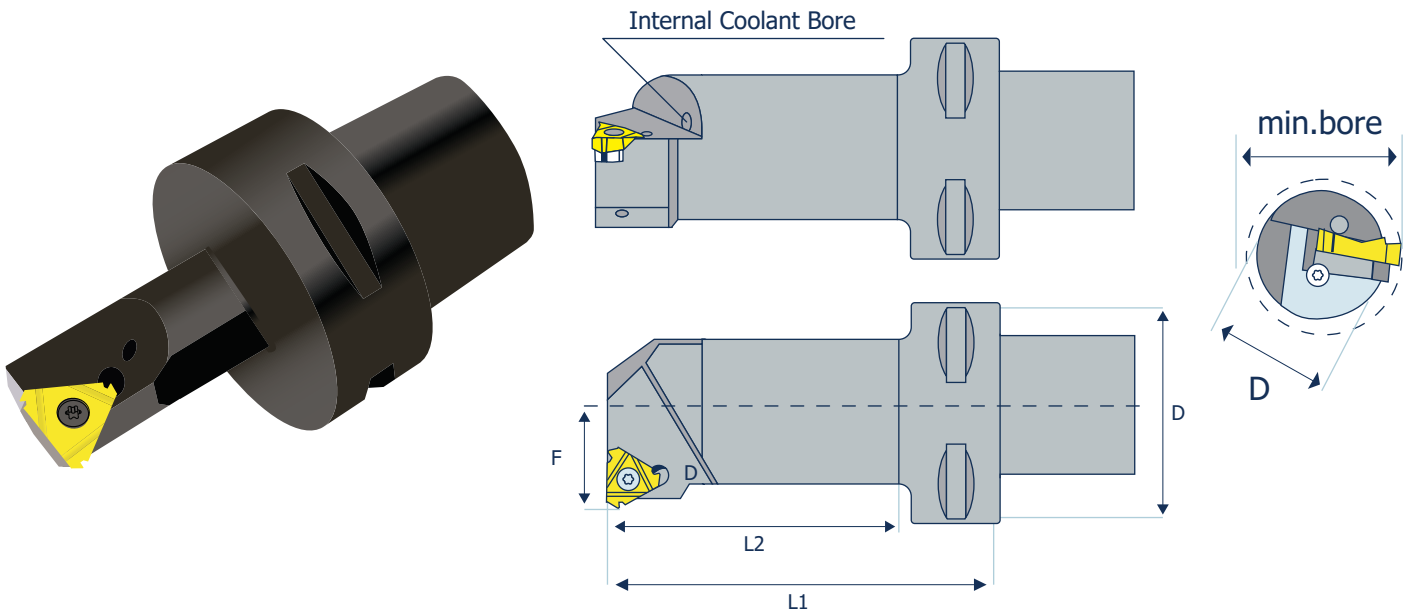
EXTERNAL TOOLHOLDER




Equivalent to...	Ordering Code Right Hand		D	F	L	Insert Screw	Anvil Screw	Torx Key	RH Anvil	LH Anvil
C4	P40-SER 27050-16	16	40	27	50	S16	Y16	K16	YE16	YI16
C5	P50-SER 35060-16	16	50	35	60	S16	Y16	K16	YE16	YI16
C6	P63-SER 45065-16	16	63	45	65	S16	Y16	K16	YE16	YI16
C4	P40-SER 27050-22	22	40	27	50	S22	Y22	K22	YE22	YI22
C5	P50-SER 35060-22	22	50	35	60	S22	Y22	K22	YE22	YI22
C6	P63-SER 45065-22	22	63	45	65	S22	Y22	K22	YE22	YI22
C8	P80-SER 55080-16	16	80	55	80	S16	Y16	K16	YE16	YI16
C8	P80-SER 55080-22	22	80	55	80	S22	Y22	K22	YE22	YI22
C6	P63-SER 45065-27	27	63	45	65	S27	Y27	K27	YE27	YI27

For **LEFT HAND** toolholders specify **SEL** instead of **SER**

1.3.18 INTERNAL HOLDERS

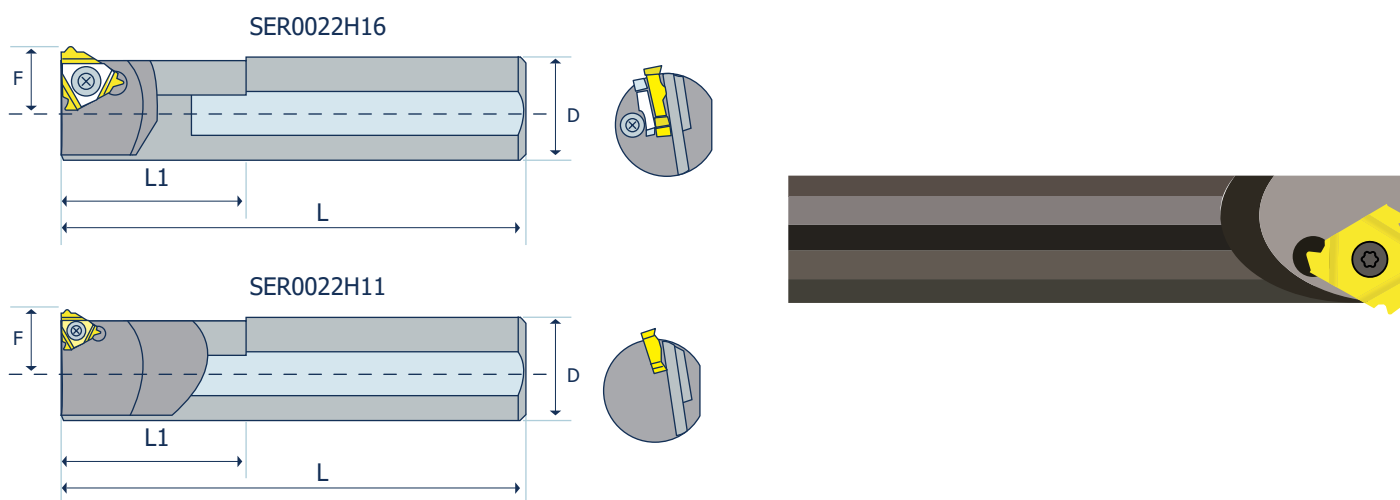



Equivalent to...	Ordering Code Right Hand		D	F	Min. Bore Dia.	L1	L2	Insert Screw	Anvil Screw	Torx Key	RH Anvil	LH Anvil
C4	P40-SIR 12060-16	16	40	11.7	20	60	37	S16	-	K16	-	-
	P40-SIR 14060-16	16	40	13.5	25	60	38	S16	Y16	K16	YI16	YE16
	P40-SIR 17070-16	16	40	16.0	29	70	48	S16	Y16	K16	YI16	YE16
	P40-SIR 22090-16	16	40	19.5	36	90	69	S16	Y16	K16	YI16	YE16
	P40-SIR 27080-16	16	40	23.5	44	80	60	S16	Y16	K16	YI16	YE16
C5	* P50-SIR 12060-16	16	50	11.7	20	60	35	S16	-	K16	-	-
	P50-SIR 14060-16	16	50	13.5	25	60	36	S16	Y16	K16	YI16	YE16
	P50-SIR 17070-16	16	50	16.0	29	70	47	S16	Y16	K16	YI16	YE16
	P50-SIR 22090-16	16	50	19.5	36	90	68	S16	Y16	K16	YI16	YE16
	P50-SIR 27105-16	16	50	23.5	44	105	84	S16	Y16	K16	YI16	YE16
C6	P63-SIR 14070-16	16	63	13.5	25	70	42	S16	Y16	K16	YI16	YE16
	P63-SIR 17075-16	16	63	16.0	29	75	48	S16	Y16	K16	YI16	YE16
	P63-SIR 22090-16	16	63	19.5	36	90	64	S16	Y16	K16	YI16	YE16
	P63-SIR 27105-16	16	63	23.5	44	105	80	S16	Y16	K16	YI16	YE16
C4	* P40-SIR 15065-22	22	40	15.4	25	65	42	S22	-	K22	-	-
	P40-SIR 19070-22	22	40	17.9	29	70	48	S22	Y22	K22	YI22	YE22
	P40-SIR 22090-22	22	40	21.4	38	90	69	S22	Y22	K22	YI22	YE22
	P40-SIR 27080-22	22	40	25.4	46	80	60	S22	Y22	K22	YI22	YE22
C5	* P50-SIR 15065-22	22	50	15.4	25	65	41	S22	-	K22	-	-
	P50-SIR 19070-22	22	50	17.9	29	70	47	S22	Y22	K22	YI22	YE22
	P50-SIR 22090-22	22	50	21.4	38	90	68	S22	Y22	K22	YI22	YE22
	P50-SIR 27105-22	22	50	25.4	46	105	84	S22	Y22	K22	YI22	YE22
C6	P63-SIR 19075-22	22	63	17.9	29	75	48	S22	Y22	K22	YI22	YE22
	P63-SIR 22090-22	22	63	21.4	38	90	64	S22	Y22	K22	YI22	YE22
	P63-SIR 27105-22	22	63	25.4	46	105	80	S22	Y22	K22	YI22	YE22

For **LEFT HAND** toolholders specify **SIL** instead of **SIR**

* Holders without anvil

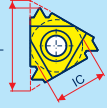






1.3.19 STAR TOOLHOLDERS Ø22

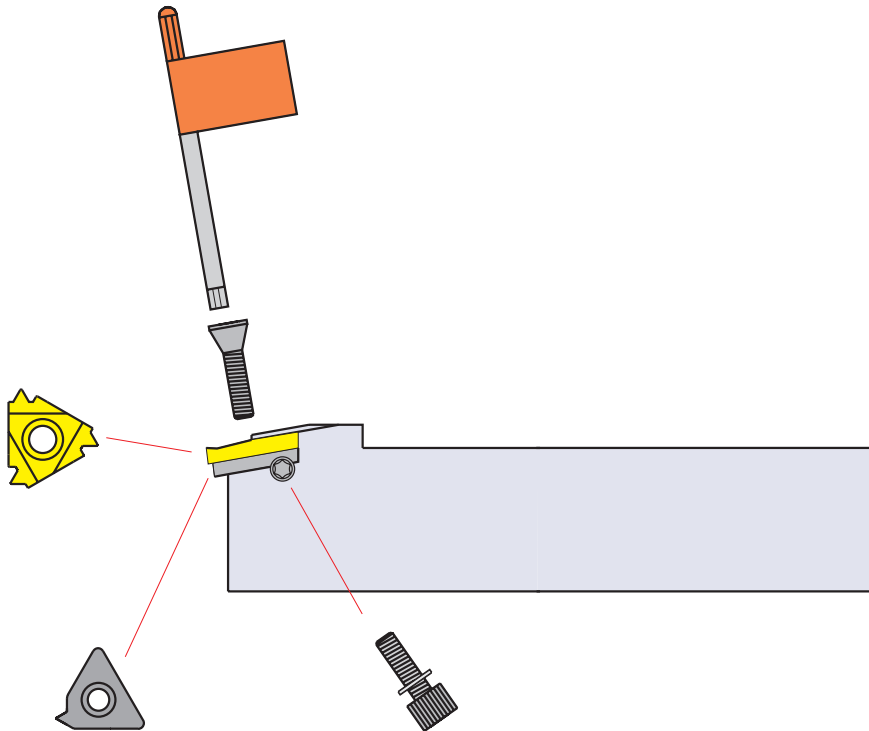


Ordering Code Right Hand		D	F	L1	F	Insert Screw	Anvil Screw	Torx Key	RH Anvil	LH Anvil
SER 0022 H11	11	22	100	40	13.3	S11	-	K11	-	-
SER 0022 H16	16	22	100	40	14.6	S16	Y16	K16	YE16	Y116

For **LEFT HAND** toolholders specify **SEL** instead of **SER**

1.3.20 SPARE PARTS | Ordering codes

							
Insert size		Insert screw	Clamp	Torx key	Anvil screw	Anvil EX RH IN IH	Anvil EX LH IN RH
L	IC						
06	5/32"	S06	-	K06	-	-	-
08	3/16"	S08	-	K08	-	-	-
08U	3/16"U	S08	-	K08	-	-	-
11	1/4"	S11	-	K11	-	-	-
11V	1/4"V	S11T	-	K11T	-	-	-
16	3/8"	S16	C16	K16	Y16	YE16 (M)	Y116 (M)
16V	3/8"V	S16T	-	K16T	-	-	-
22	1/2"	S22	C22	K22	Y22	YE22 (M)	Y122 (M)
22U	1/2"U	S22	C22	K22	Y22	YE22U	Y122U
22V	1/2"V	S22T	-	K22T	-	-	-
27	5/8"	S27	C27	K27	Y27	YE27 (M)	Y127 (M)
27U	5/8"U	S27	C27	K27	Y27	YE27U	Y127U
27V	5/8"V	S27T	-	K27T	-	-	-
33U	3/4U	S33	-	K33	-	-	-





1.4 TECHNICAL INFORMATION

1.4.1 CARBIDE GRADE SELECTION

CHOOSE THE COMBIDEX GRADE SPECIFICALLY FORMULATED FOR YOUR APPLICATION FROM THE FOLLOWING LIST:

COATED GRADES

FXS (M10-M20) (K05-K20) (N10-N20) (S10-S20)	PVD triple layer coated sub-micron grade for stainless steels, cast iron, titanium, non ferrous metals and most of the high temperature alloys.
FXA (P20-P40) (K20-K30)	PVD TiAlN coated sub-micrograin grade for stainless steels and exotic materials at medium to high cutting speeds.
PC30 (P15-P35)	PVD TiN coated grade for treated and hard alloy steels (25 HRc & up) at medium to low cutting speeds.
FXC (K10-K20) (P10-P25)	PVD TiN coated micrograin for free cutting untreated alloy steels (below 30 HRc), for stainless steels and cast iron.
FXCL (P30-P50) (K25-K40)	PVD TiN coated grade for low cutting speed. Works well with wide range of stainless steels.

UNCOATED GRADES

P30* (P20-P30)	Carbide grade for carbon and cast steels, works well at medium to low cutting speeds.
K20* (K10-K30)	*Arbide grade for non ferrous metals, aluminum and cast iron.

*UPON REQUEST

Note: Due to our unique and specialized production techniques, Combindex coated inserts provide superior cutting performance and exceptionally long tool life.

Grade availability per inserts size

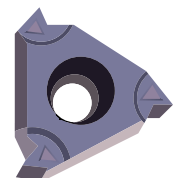
Grade	FXS	FXA	P30	FXC	FXCL	P30	K20
Insert sizes	11, 16, 22	06, 08, 11, 16, 22, 27, 33U,	11, 16, 22, 27, 33U	11, 16, 22, 27, 33U	06, 08	11, 16, 22, 27, 33U	06, 08 11, 16, 22, 27, 33U
	Type-B 11, 16	Type-B 11, 16					

Type B - Threading Inserts

A combination of ground profile, and sintered chip-breaker threading inserts. Unlike most other manufacturers inserts, this combination ensures a consistent high quality thread, with precise shape and dimensions.

Two different unique styles of chip-breaker were designed to suit the different specific requirements of Internal threads and External threads.

All of Combindex Type B inserts are made of FXA Sub-Micrograin grade.

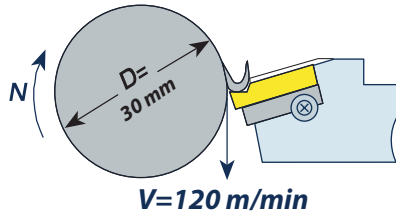


1.4.2 RECOMMENDED CUTTING SPEED (m/min)

ISO Standard	Material	Condition	FXS	FXA	PC30	FXC	FXCL	K20	P30	
P	Non-Alloy Steel and Cast Steel, Free Cutting Steel	<0.25%C	Annealed	110-210	120-180	100-180	100-180	70-150	50-130	
		≥0.25%C	Annealed							
		<0.55%C	Quenched & Tempered							
		≥0.55%C	Annealed							
			Quenched & Tempered							
	Low Alloy Steel and Cast Steel (less than 5% alloying elements)	Annealed	90-140	80-130	70-120	70-120	60-90	50-80		
High Alloy Steel, Cast Steel, and Tool Steel	Annealed	70-90	60-80	50-60	55-70	50-60	40-50			
	Quenched & Tempered									
M	Stainless Steel and Cast Steel	Ferritic / Martensitic	110-160	90-130	60-90	60-90	50-80	50-80		
		Martensitic								
		Austenitic								
K	Cast Iron Nodular (GGG)	Ferritic / Pearlitic	120-150	100-130		80-110	60-90			
		Pearlitic								
	Grey Cast Iron (GG)	Ferritic	140-150	120-130		90-100	65-85			
		Pearlitic								
	Malleable Cast Iron	Ferritic	110-140	100-130		80-100	60-85			
		Pearlitic								
N	Aluminum-Wrought Alloy	Not Cureable	250-500			200-400	150-400	200-400	100-400	
		Cured								
	Aluminum-Cast, Alloyed	≤12% Si	Not Cureable	280-500			200-500	150-350	200-500	110-300
		>12% Si	High Temperature							
	Copper Alloys	>1% Pb	Free Cutting	190-350			150-250	110-180	150-250	90-150
			Brass							
		Electrolytic Copper								
	Non Metallic	Duroplastics, Fiber Plastics, Hard Rubber				200-300	150-210	100-200	110-150	
S	High Temp. Alloys, Super Alloys	Fe based	Annealed	30-65	25-60					
			Cured							
		Ni or Co based	Annealed							
			Cured							
Titanium Alloys	Alpha +Beta Alloys Cured	40-50	35-45				35-45			
H	Hardened Steel	Hardened 45-50 HRc	40-50	35-45						
		Hardened 51-55 HRc								
		Hardened 56-62 HRc								
	Chilled Cast Iron	Cast	30-40	25-35						
	Cast Iron	Hardened	20-30	15-25						

1.4.3 CONVERSION OF CUTTING SPEED TO ROTATIONAL SPEED

Conversion of a selected cuttingspeed to rotational speed is calculated by the following formula:



Example

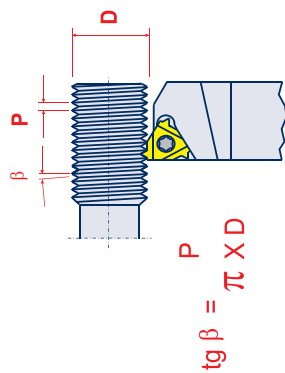
$$N = \frac{V \times 1000}{\pi \times D} = \frac{120 \times 1000}{3.14 \times 30} = 1274 \text{ RPM}$$

Number of passes and depth of cut per pass for multitooth insert

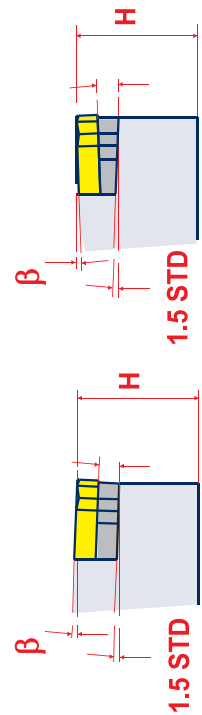
	Insert Size				No. of Teeth	Ordering Code	No. of Passes	Depth of Cut per pass			
	Pitch mm	L	I.C.(in)					1	2	3	4
ISO External	1.00	16	3/8	3	16 ER 1.0 ISO 3M	2	0.38	0.25			
	1.50	16	3/8	2	16 ER 1.5 ISO 2M	3	0.42	0.30	0.20		
	1.50	22	1/2	3	22 ER 1.5 ISO 3M	2	0.55	0.37			
	2.00	22	1/2	2	22 ER 2.0 ISO 2M	3	0.57	0.40	0.28		
	2.00	22	1/2	3	22 ER 2.0 ISO 3M	2	0.76	0.49			
ISO Internal	1.00	16	3/8	3	16 IR 1.0 ISO 3M	2	0.33	0.25			
	1.50	16	3/8	2	16 IR 1.5 ISO 2M	3	0.38	0.29	0.20		
	1.50	22	1/2	3	22 IR 1.5 ISO 3M	2	0.50	0.37			
	2.00	22	1/2	2	22 IR 2.0 ISO 2M	3	0.52	0.37	0.26		
	2.00	22	1/2	3	22 IR 2.0 ISO 3M	2	0.70	0.45			
UN External	16	16	3/8	2	16 ER 16 UN 2M	3	0.44	0.31	0.22		
	16	22	1/2	3	22 ER 16 UN 3M	2	0.58	0.39			
	12	22	1/2	2	22 ER 12 UN 2M	3	0.59	0.42	0.30		
	12	22	1/2	3	22 ER 12 UN 3M	2	0.78	0.52			
	8	27	5/8	2	27 ER 8 UN 2M	4	0.62	0.54	0.45	0.35	
UN Internal	16	16	3/8	2	16 IR 16 UN 2M	3	0.42	0.28	0.22		
	16	22	1/2	3	22 IR 16 UN 3M	2	0.55	0.37			
	12	22	1/2	2	22 IR 12 UN 2M	3	0.53	0.38	0.31		
	12	22	1/2	3	22 IR 12 UN 3M	2	0.74	0.48			
	8	27	5/8	2	27 IR 8 UN 2M	4	0.63	0.50	0.40	0.30	
Whitworth 55° External	14	16	3/8	2	16 ER 14 W 2M	3	0.52	0.37	0.27		
	14	22	1/2	3	22 ER 14 W 3M	2	0.70	0.46			
	11	22	1/2	2	22 ER 11 W 2M	3	0.67	0.47	0.34		
Whitworth 55° Internal	14	16	3/8	2	16 IR 14 W 2M	3	0.52	0.37	0.27		
	14	22	1/2	3	22 IR 14 W 3M	2	0.70	0.46			
	11	22	1/2	2	22 IR 11 W 2M	2	0.67	0.47	0.34		
NPT External	14	16	3/8	2	16 ER 14 NPT 2M	3					
	11.5	22	1/2	2	22 ER 11.5 NPT 2M	4	0.54	0.47	0.37	0.30	
	11.5	27	5/8	3	27 ER 11.5 NPT 3M	4	0.76	0.54	0.38		
NPT Internal	14	16	3/8	2	16 IR 14 NPT 2M	3					
	11.5	22	1/2	2	22 IR 11.5 NPT 2M	4	0.54	0.47	0.37	0.30	
	11.5	27	5/8	3	27 IR 11.5 NPT 3M	4	0.76	0.54	0.38		
API Round External	10	22	1/2	2	22 ER 10 APIRD 2M	3	0.60	0.50	0.31		
	10	27	5/8	3	27 ER 10 APIRD 3M	2	1.00	0.41			
	8	27	5/8	2	27 ER 8 APIRD 2M	3	0.80	0.60	0.41		
API Round Internal	10	22	1/2	2	22 IR 10 APIRD 2M	3	0.60	0.50	0.31		
	10	27	5/8	3	27 IR 10 APIRD 3M	2	1.00	0.41			
	8	27	5/8	2	27 IR 8 APIRD 2M	3	0.80	0.60	0.41		

1.4.4 STANDARD AND SLANTED ANVILS

FORMULA

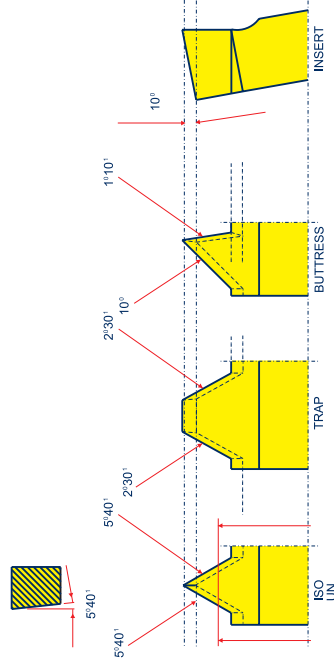


HELIX ANGLE



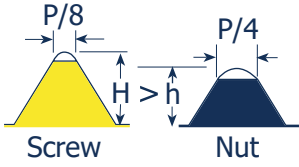
Note: "H" dimension remains constant for every insert / anvil combination. Positive helix angles are applicable when turning R.H. thread with R.H. holder or L.H. thread with L.H. toolholder. Negative helix angles are applicable when turning R.H. thread with L.H. holder or L.H. thread with R.H. toolholder.

FLANK CLEARANCE ANGEL

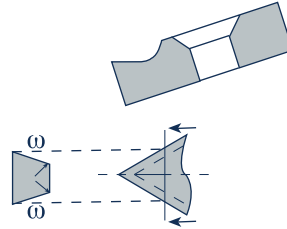


L	total helix angle holder	4,5°	4,0°	3,5°	3,0°	2,5°	2,0°	1,5°	1,0°	0,5°	0,0°	-0,5°	-1,0°	-1,5°
16	EX RH/IN LH	YE 16-3P	YE 16-2.5P	YE 16-2P	YE 16-1.5P	YE 16-1P	YE 16-0.5P	YE 16	YE 16-0.5N	YE 16-1N	YE 16-1.5N	YE 16-2N	YE 16-2.5N	YE 16-3N
(3/8)	EX LH/IN RH	YI 16-3P	YI 16-2.5P	YI 16-2P	YI 16-1.5P	YI 16-1P	YI 16-0.5P	YI 16	YI 16-0.5N	YI 16-1N	YI 16-1.5N	YI 16-2N	YI 16-2.5N	YI 16-3N
22	EX RH/IN LH	YE 22-3P	YE 22-2P	YE 22-2P	YE 22-1P	YE 22-1P	YE 22-1P	YE 22		YE 22-1N	YE 22-1N	YE 22-2N	YE 22-2N	YE 22-3N
(1/2)	EX LH/IN RH	YI 2-3P	YI 22-2P	YI 22-2P	YI 22-1P	YI 22-1P	YI 22-1P	YI 22		YI 22-1N	YI 22-1N	YI 22-2N	YI 22-2N	YI 22-3N
27	EX RH/IN LH	YE 27-3P	YE 27-2P	YE 27-2P	YE 27-1P	YE 27-1P	YE 27-1P	YE 27		YE 27-1N	YE 27-1N	YE 27-2N	YE 27-2N	YE 27-3N
(5/8)	EX LH/IN RH	YI 27-3P	YI 27-2P	YI 27-2P	YI 27-1P	YI 27-1P	YI 27-1P	YI 27		YI 27-1N	YI 27-1N	YI 27-2N	YI 27-2N	YI 27-3N
22U	EX RH/IN LH	YE 22U-3P	YE 22U-2P	YE 22U-2P	YE 22U-1P	YE 22U-1P	YE 22U-1P	YE 22U		YE 22U-1N	YE 22U-1N	YE 22U-2N	YE 22U-2N	YE 22-3N
(1/2)	EX LH/IN RH	YI 22U-3P	YI 22U-2P	YI 22U-2P	YI 22U-1P	YI 22U-1P	YI 22U-1P	YI 22U		YI 22U-1N	YI 22U-1N	YI 22U-2N	YI 22U-2N	YI 22-3N
27U	EX RH/IN LH	YE 27U-3P	YE 27U-2P	YE 27U-2P	YE 27U-1P	YE 27U-1P	YE 27U-1P	YE 27U		YE 27U-1N	YE 27U-1N	YE 27U-2N	YE 27U-2N	YE 27U-3N
(5/8)	EX LH/IN RH	YI 27U-3P	YI 27U-2P	YI 27U-2P	YI 27U-1P	YI 27U-1P	YI 27U-1P	YI 27U		YI 27U-1N	YI 27U-1N	YI 27U-2N	YI 27U-2N	YI 27U-3N

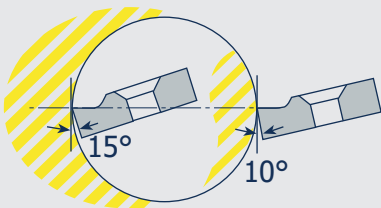
1.4.5 IMPORTANT POINTS ABOUT COMBIDEX THREADING INSERTS | Flank clearance angle



1. In most thread forms internal and external threads have different depth and radii, thus tools are not interchangeable



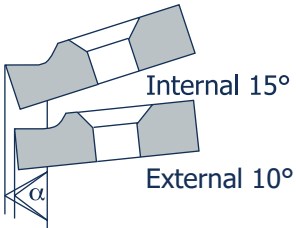
3. Our built-in relief angles ensure automatic insert flank angle clearance.



2. The Insert relief angle of a standard Combidex external toolholder is 10°; for an internal toolholder it is 15°. This 5° difference is to provide additional necessary radial clearance.



4. Insert and toolholder should always match. An IN-RH insert must be used with an IN-RH toolholder. No mismatch is allowed.



5. Profiles of Combidex internal & external threading inserts are precision ground to ensure accurate thread geometry when used in their corresponding toolholders. Using internal inserts with an external holder will result in distortion of angle and insert geometry.

FLANK CLEARANCE ANGLE

$$\omega = \text{ArcTan}(\tan \alpha \times \tan \phi)$$

<p>ω = 5.8° 5.8°</p>	<p>ω = 2.6° 2.6°</p>	<p>ω = 10° 1.24°</p>	<p>ω = 5.8° 0.5°</p>
ϕ = 10° for External toolholders			
<p>ω = 8.8° 8.8° 2α = 60°</p>	<p>ω = 4° 4° 2α = 30° 2α = 29°</p>	<p>ω = 15° 1.9° α = 45° α = 7°</p>	<p>ω = 8.8° 0.8° α = 30° α = 3°</p>
ϕ = 15° for Internal toolholders			

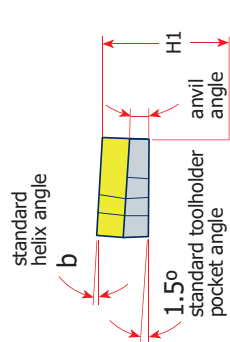
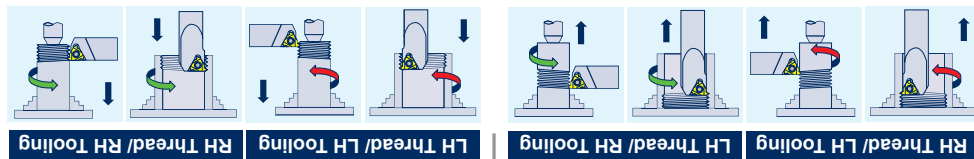
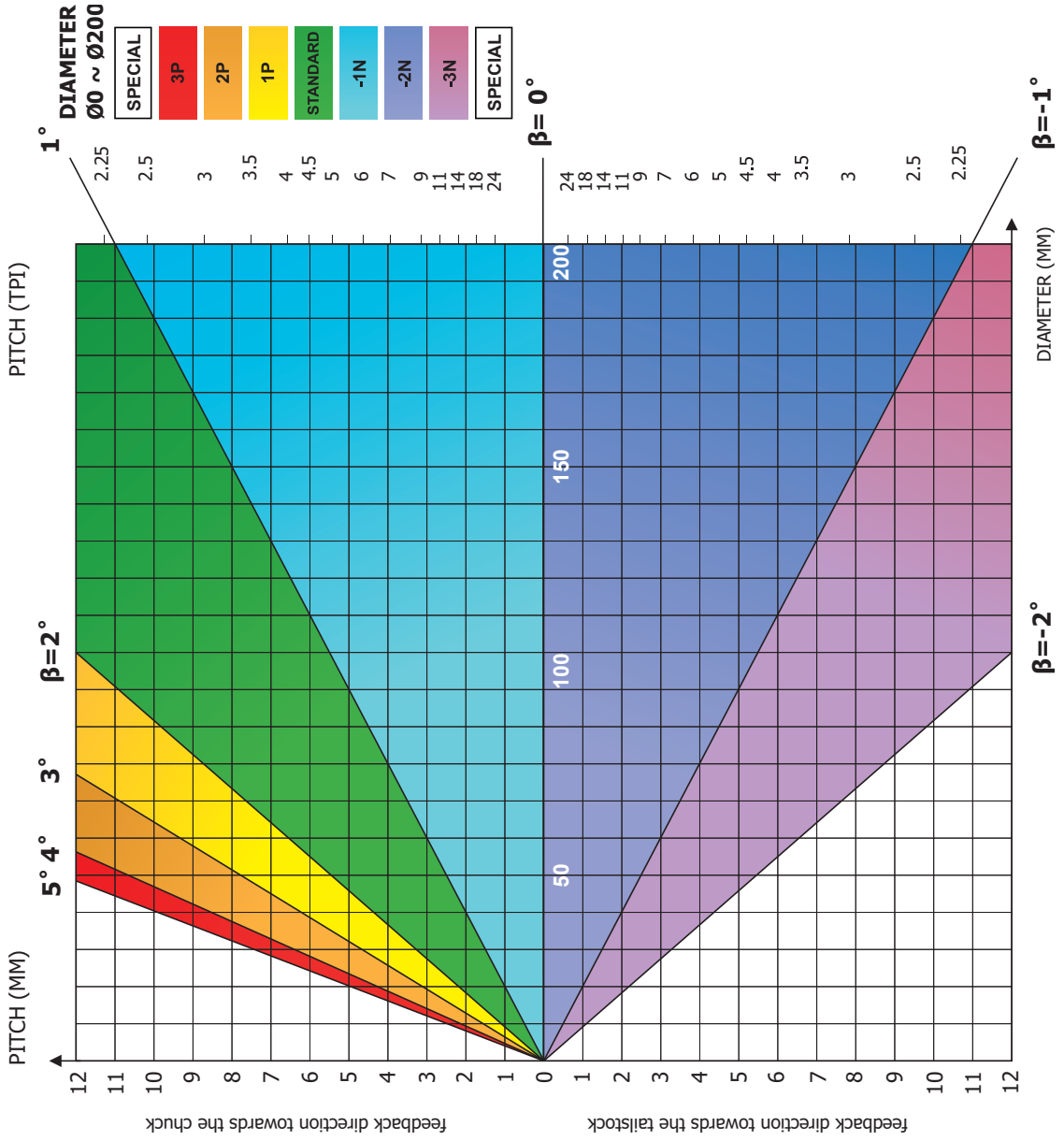
ISO, UN
PARTIAL
60 NPT

TRAPEZ
ACME
STACME

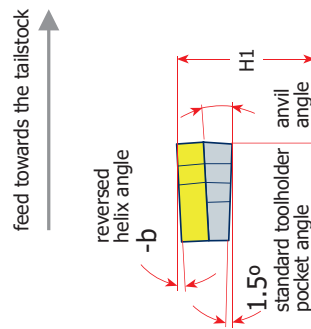
AMERICAN
BUTTRESS

SAGE
(DIN 513)

1.4.6 HELIX ANGLE DIAGRAM



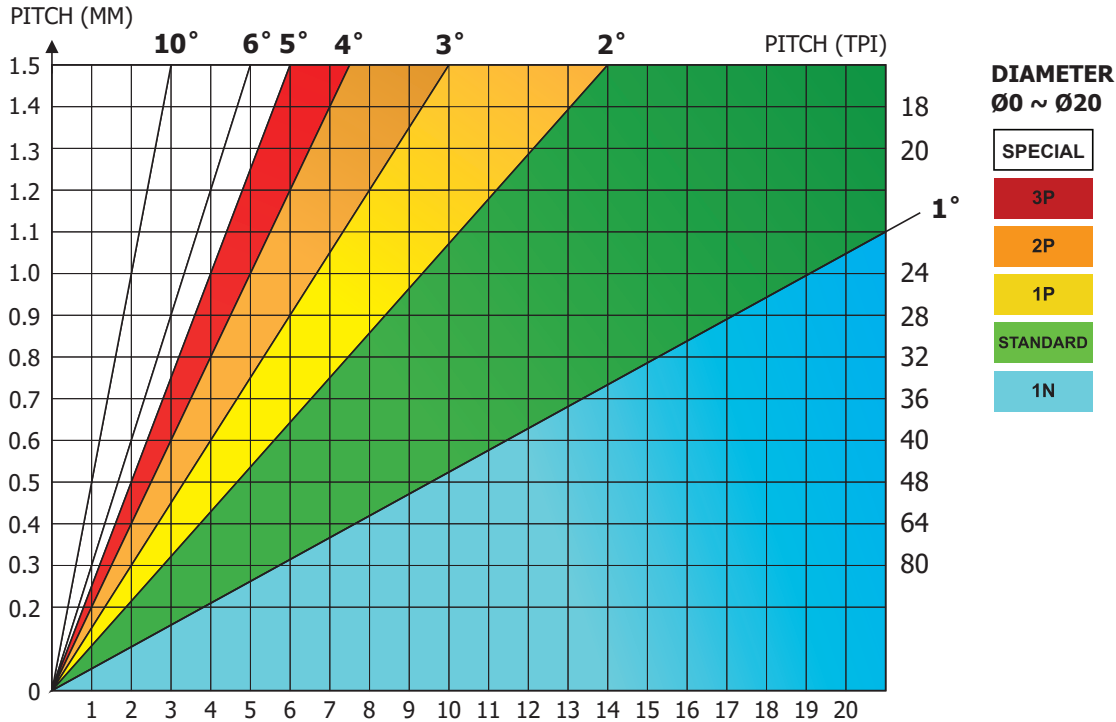
feed towards the chuck



feed towards the tailstock

The dimension H1 (cutting edge height) remains constant with every insert/anvil combination.

1.4.6 HELIX ANGLE DIAGRAM & (SMALLER DIAMETER (Ø0 ~ Ø20))



LET OP Voor externe draad calculeren met de kerndiameter.
 Voor interne draad calculeren met de buitendiameter.

CUTTING PASSES SELECTION

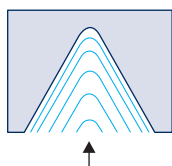
NUMBER OF CUTTING PASSES SELECTION

PITCH	MM	0.5	1.0	1.5	2.0	2.5	3.0	4.0	6.0
	TPI	48	24	16	12	10	8	6	4
NUMBER OF PASSES		3-6	4-9	5-11	6-13	7-15	8-17	10-20	11-22

1.4.7 THREAD TURNING METHODS

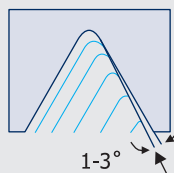
THREAD	INSERT & TOOLHOLDER	ROTATION	FEED DIRECTION	HELIX METHOD	DRAWING NO.
Right Hand	EX RH	Anticlockwise	Towards chuck	Regular	1
External	EX LH	Clockwise	From chuck	Reversed	2
Right Hand	IN RH	Anticlockwise	Towards chuck	Regular	3
Internal	IN LH	Clockwise	From chuck	Reversed	4
Left Hand	EX LH	Clockwise	Towards chuck	Regular	5
External	EX RH	Anticlockwise	From chuck	Reversed	6
Left Hand	IN LH	Clockwise	Towards chuck	Regular	7
Internal	IN RH	Anticlockwise	From chuck	Reversed	8

RADIAL INFEEED	FLANK INFEEED (modified)	ALTERNATE FLANK INFEEED
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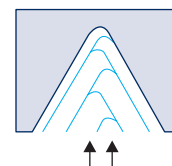
Radial infeed is the simplest and quickest method. The feed is perpendicular to the turning axis, and both flanks of the insert perform the cutting operation. Radial infeed is recommended in 3 cases:

- When the pitch is smaller than 16 tpi
- For material with short chips
- For work with hardened material



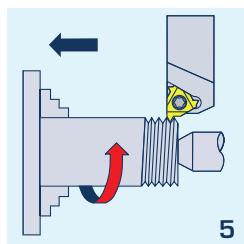
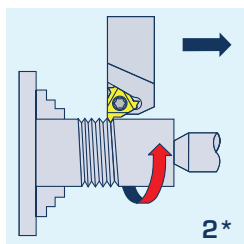
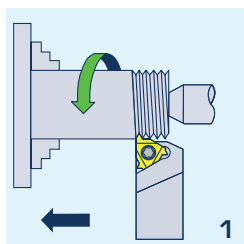
Flank infeed is recommended in the following cases:

- When the thread pitch is greater than 16 tpi., using the radial method, the effective cutting edge length is too large, resulting in chatter.
- For TRAPEZ and ACME. The radial method result in three cutting edges, making chip flow very difficult.

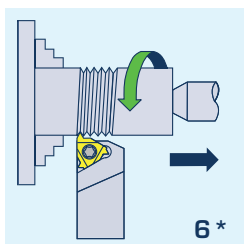


Use of the alternate flank method is recommended especially in large pitches and for materials with long chips. This method divides the load equally on both flanks, resulting in equal wear along the cutting edges. Alternate flank infeed requires more complicated programming, and is not available on all lathes.

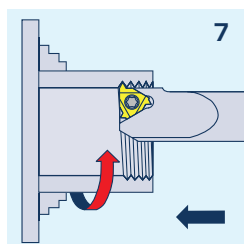
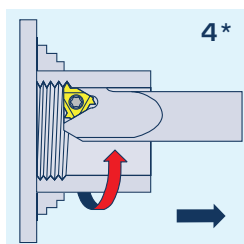
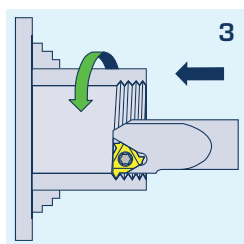
external RH thread



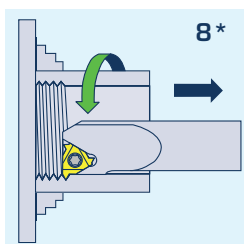
external LH thread



internal RH thread



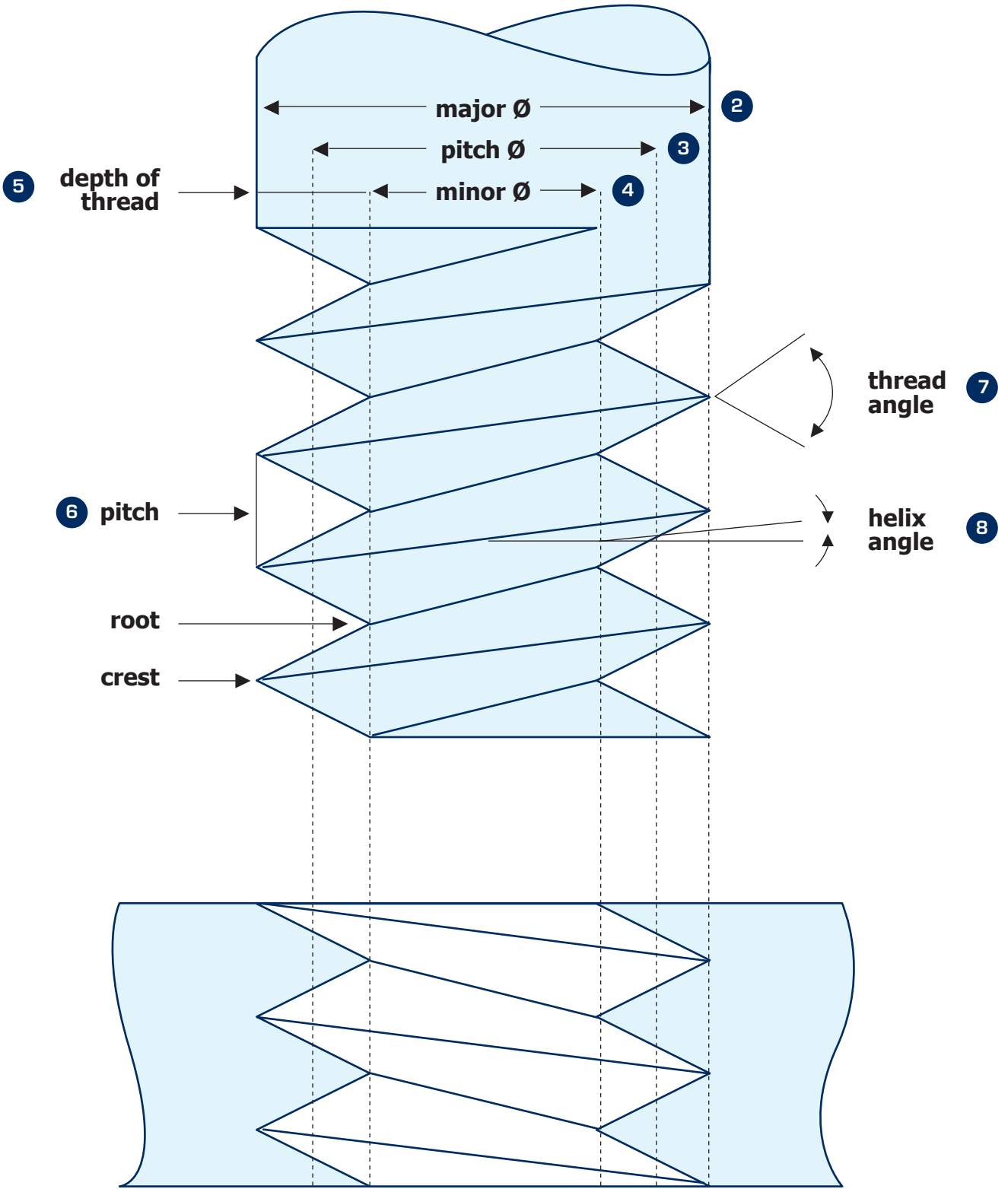
internal LH thread



* Change anvil to negative anvil. 3° N maximum

1

external thread



internal thread

9

1.4.8 THREAD TERMINOLOGY

1

External thread

A thread on the external surface of a cylinder screw or cone.

2

Major diameter

The largest diameter of a screw thread

3

Pitch diameter

On a straight thread, the diameter of an imaginary cylinder, the surface of which cuts the thread forms where the width of the thread and groove are equal.

4

Minor diameter

The smallest diameter of a screw thread.

Nominal diameter

the diameter from which the diameter limits are derived by the application of deviation allowances and tolerances.

5

Depth of thread

The distance between crest and root measured normal to the axis.

6

Pitch

The distance between corresponding points on adjacent thread forms measured parallel to the axis. This distance can be defined in millimeters or by the τ_{pi} [threads per inch], which is the reciprocal of the pitch.

7

Thread angle

8

Helix angle

For a straight thread, where the lead of the thread and the pitch diameter circle circumference form a right angled triangle, the helix angle is the angle opposite the lead.

9

Internal thread

A thread on the internal surface of a cylinder or cone.

Straight thread

A thread formed on a cylinder.

Taper thread

A thread formed on a cone.

Combidex

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